Annual Show Issue and Specification Number

MOTOR AGE

Volume XXXVII
Number 5

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CHICAGO, JANUARY 29, 1920

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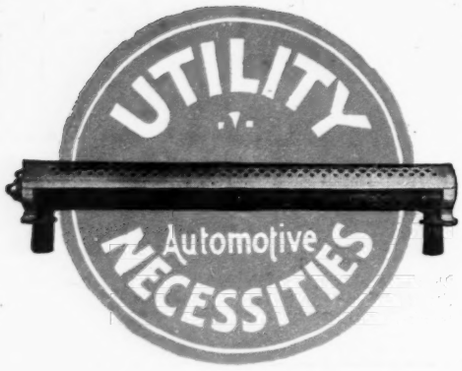
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UTILITY Jr. *for* Fords

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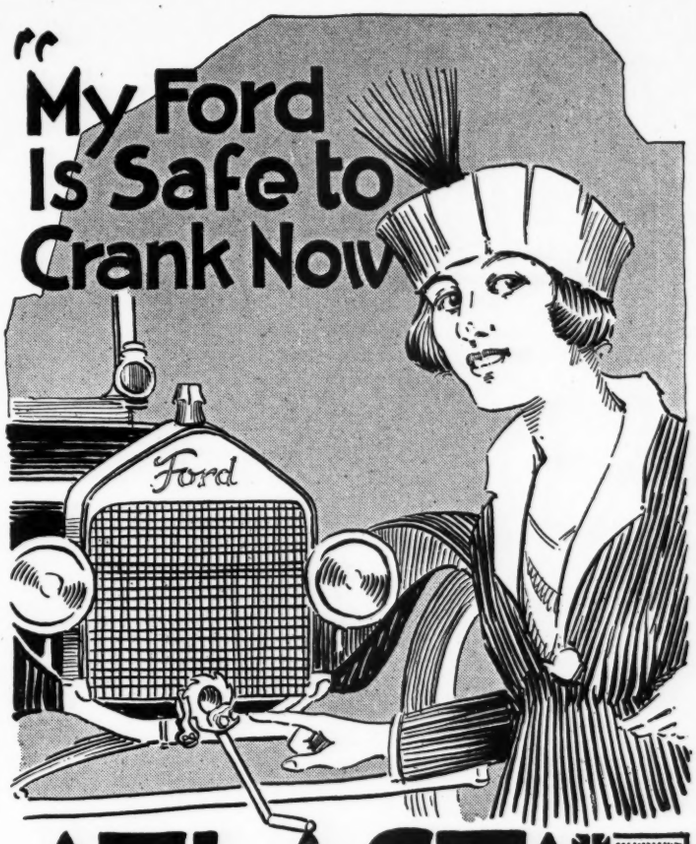
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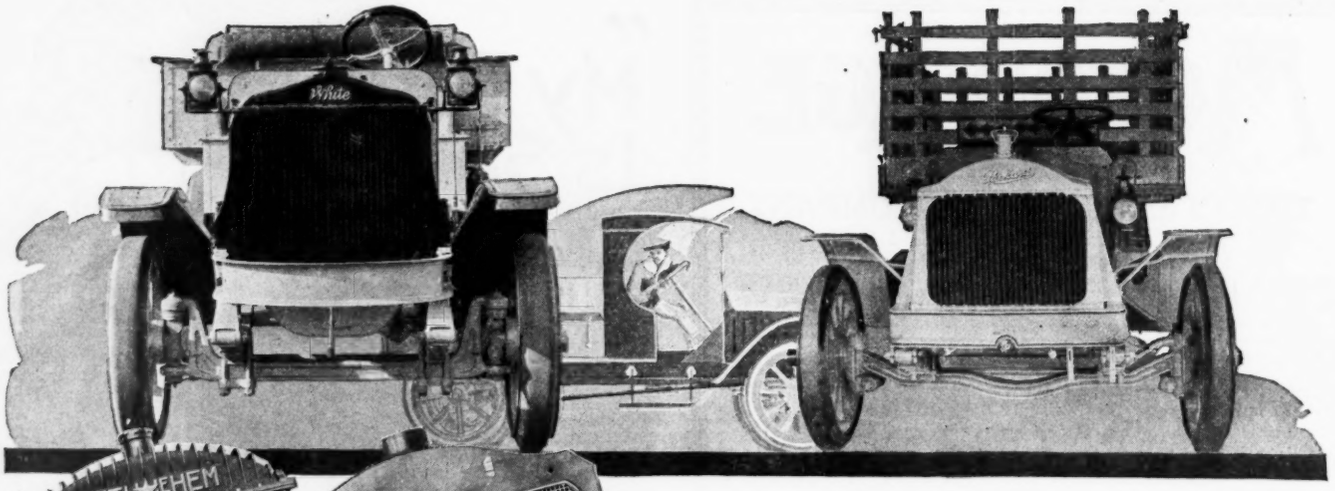
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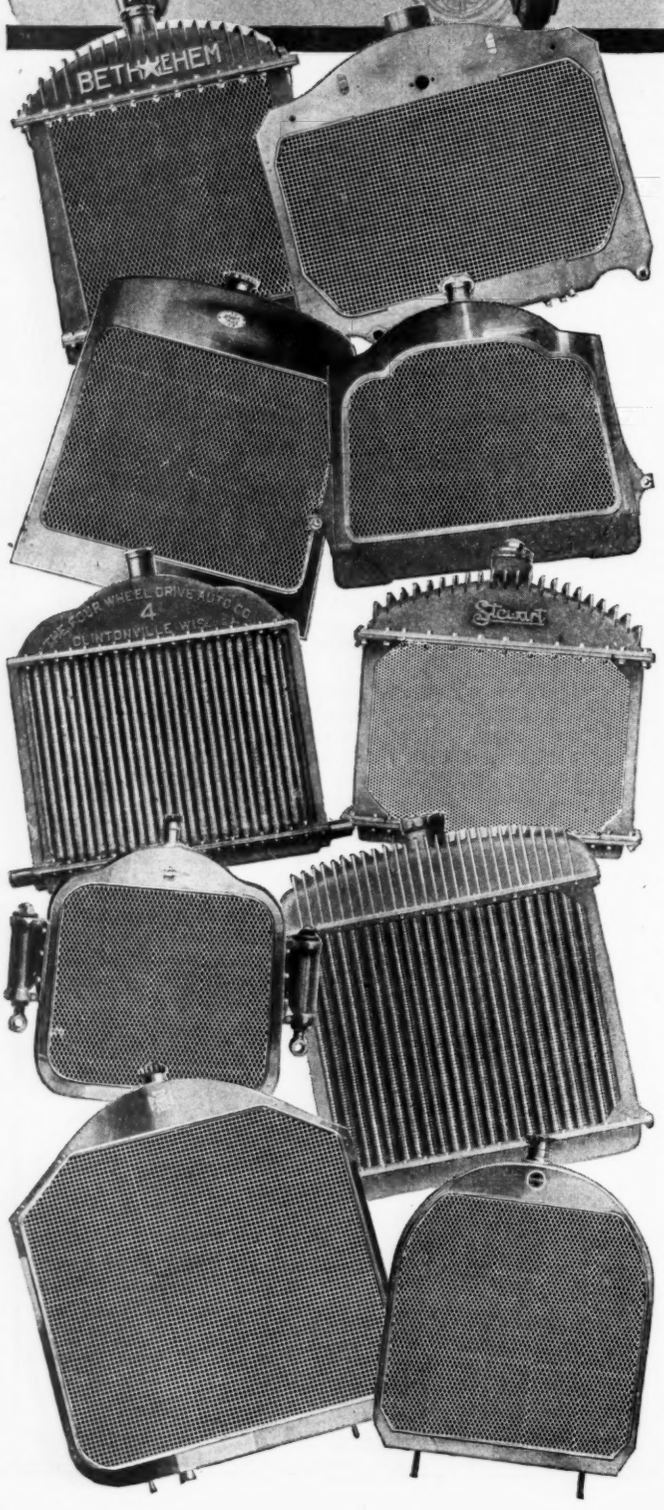
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MOTOR AGE



MOTOR AGE takes great pride this year in presenting to its readers its Annual Shows and Specification Issue. This issue is a comprehensive survey of the automotive industry as a whole, the new cars, trucks and tractors offered for the 1920 season, a prognostication of what the coming year holds forth for the automobile trade and complete and detailed information of the specifications of the various automotive vehicles offered by American manufacturers.

THIS issue has been prepared and written since the National Automobile Shows of New York and Chicago. In this way, MOTOR AGE has been enabled to gain a good perspective of the industry as a whole, a far more complete summary is therefore possible than would have ben the case had it confined itself to the exhibits at any one show. New York, as a rule, gives a composite view of the industry, but Chicago usually has a few new and valuable things to offer. By combining what it has learned both at New York and Chicago, MOTOR AGE is well equipped to give its readers what it firmly believes to be its most valuable Show Issue.

WHAT YOU WILL FIND IN THIS ISSUE AND WHERE YOU WILL FIND IT

The Chicago Show, A Maintenance Signboard - - - - - - - - - 9
By B. M. IKERT

The Chicago Automobile Show demonstrates the growing importance with which manufacturers are coming to regard the accessibility of their models from a service standpoint. In this article Mr. Ikert cites some of the examples of the trend in this direction.

Trend of Car Design - - - - - - - - - - - - - - 14
BY J. E. SCHIPPER

What sort of cars will 1920 have to offer? What is the trend of design in engineering? Mr. Schipper makes an exhaustive analysis of these questions and presents his conclusions in a most interesting and intelligible manner.

The Composite Car of 1920 - - - - - - - - - - - - - 19
BY ROY E. BERG

We might say that Mr. Berg has taken the cars of 1920, melted them up and out of the mass evolved the Average Car of 1920. Perhaps some of the parts of the Average Car may astonish you,—but the figures prove them.

Body Styles of 1920 - - - - - - - - - - - - - - 24

Naturally you are interested in what the outside of the cars you have to sell will look like in 1920. This article will tell you briefly about the general styles for the coming season.

New Passenger Cars at the Chicago Show - - - - - - - - - - 26

Several manufacturers made the first showing of their cars at the Chicago Show this year. These models are briefly described in this week's issue of MOTOR AGE.

America's Cars for 1920 - - - - - - - - - - - - - 33

There is no need of introducing this feature to our old readers. For the benefit of our new ones, we say that it presents in pictorial form the leading car models of American manufacturers together with a brief description of the salient features of the 1920 models and especially wherein they differ from previous years.

The Chicago Truck Show of 1920 - - - - - - - - - - - - 79

More and more motor car dealers are turning to the possibilities of adding trucks to their line of merchandise. The Chicago now offers a good chance to see what the trucks offer this year.

New Trucks at the Chicago Show - - - - - - - - - - - - 81

Even more than in the case of the passenger car, the annual Chicago show offers the latest in design. Some of the new trucks of 1920 are here briefly described.

The Tendency of Truck Design - - - - - - - - - - - - 85

Trucks even more than passenger cars, show changes in engineering design as well as reflecting the requirements of the every changing uses to which they are now being put. This article describes these changes briefly.

The Tendency of Tractor Design - - - - - - - - - - - - 87

Tractors have not yet reached the stage of development where it is really possible to presage the coming tendency. Yet there are a few outstanding tendencies apparent to an expert observer such as Mr. Loomis.

Service - - - - - - - - - - - - - - - - - - - 90

Of course you are interested in service, and MOTOR AGE here presents some thoughts on this big subject by two dealers whose establishments are noted for the quality of the service they render.

Specifications of 1920 Automotive Products - - - - - - - - - - - 126

Here are in brief and tabulated form, the mechanical specifications of passenger cars, trucks, tractors, etc.

(A full table of contents will be found on page 3 of this issue)



General view of Chicago's twentieth annual automobile show, looking north in the Coliseum. The view shows how the floor has been divided into four identical sections and the gr eat number of lights used to illuminate the car exhibits

Automobiles – Exhibitions

CHICAGO'S SHOW
Maintenance Signboard

By B. M. IKERT
(Motor Age Editorial Staff)

CHICAGO, Jan. 24.—We have reached that point in the course of our motor car industry where the question of maintenance and service of the product is getting more and more consideration, with the possibility that in 1922 or thereabouts, it will predominate over production and sales, if the significant facts brought out at the twentieth annual Chicago show which opened here to-day are any sort of indication as to what is going on in our motor car factories.

Shows like Chicago and New York offer the best possible opportunity for viewing the whole industry and by comparison or study of the different models each year, there naturally is afforded a chance to make certain deductions. From these deductions we are able to tell in a measure what the tendencies are in design and construction at present, what they may be in a few years and how we must look at the various questions of service and other associated factors.

The Chicago show each year affords the best possible opportunity of seeing what the industry offers in the way of improvements. There always have been lessons learned at these shows and this year's lesson is that car makers are giving the thought of maintenance greater consideration.

In the years from 1900 to 1912 looking over the cars exhibited at the shows was simply looking over experimental jobs. Cars and chasses were often curiosities. Makers were trying to outdo one another

in bringing out freakish designs. It was the period during which the industry was trying out all manner of spring suspensions, engine constructions, drives, etc. It was indeed seldom in those days that a maker showed the same car two years in succession. Those were changing times and the product was changing just as rapidly as new ideas found their way into the drafting rooms of the makers.

Production was not the major thought at that time, nor could it have been, when we did not know exactly what to make. The first lesson was to learn just what was needed and by natural processes of elimination year after year there came at last along about 1910 a time when cars began looking pretty much the same. The question of cylinders, gearset locations, lubricating systems, etc., were beginning to get standardized to some extent by co-ordination of the efforts of the makers and the various engineering societies.

The second period in the line of progress throughout the industry lies between 1910 and 1920 and might be called the period of production and sales. In those years we began seeing electric starting and lighting systems, doors in front and the cars were getting away from the looks of horse-drawn vehicles. People were buying in big numbers and soon we found our factories tooling up for quantity production. The makers, having found after years of experimenting what their product ought to be like, took steps for quantity work and substituted machine-made goods for hand work. That is, having found out pretty well what the units of a car were going to be like for a few years to come they installed machinery for making those units in large numbers and faster than hand work could hope to do.

Service Period Now Beginning.

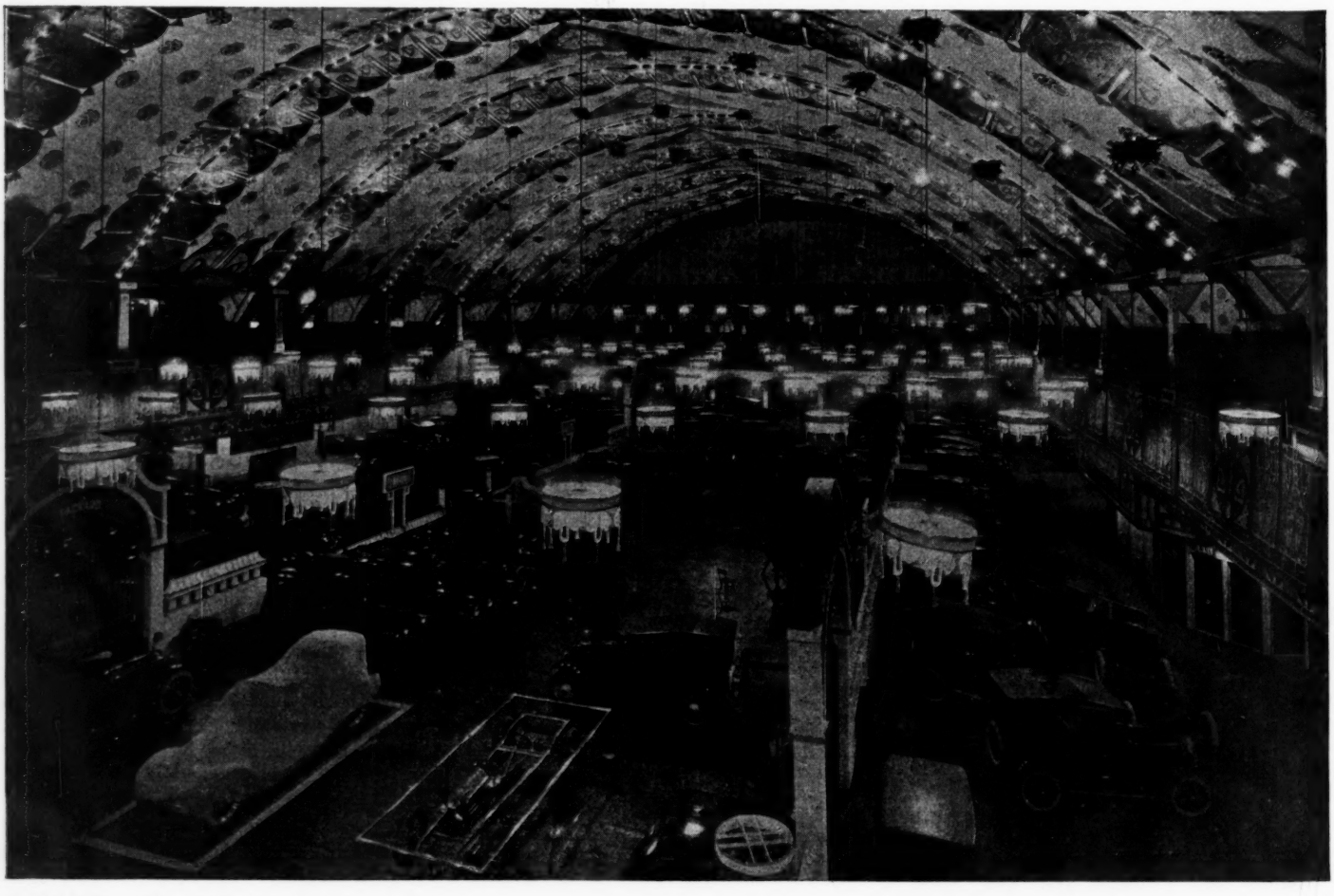
The standardization work of the S. A. E. in getting car constructions, engine layouts, etc., standardized to such an extent that all carbureters of a certain size fit all engine manifolds, magnetoes fit all bases, the screw threads are the same on bolts, etc., has helped greatly in shaping car constructions. The result is that all our cars, with the exception of a few radical designs, follow very closely along the same general lines. With this standardization of the product, or in other words, knowing what to build, there naturally came the sales organizations to take care of the quantity productions.

We are just at the threshold now of another period, that of maintenance or service. For, having found early in the history of the industry what was wanted, we later developed the product, and making it in huge quantities soon taught us that with cars going everywhere, the question of looking after those cars was each year becoming a greater problem. Therefore, we have reached the point in the industry's progress where the makers are giving the service problem greater thought and those who looked over the cars at the shows this year could not help realize this fact.

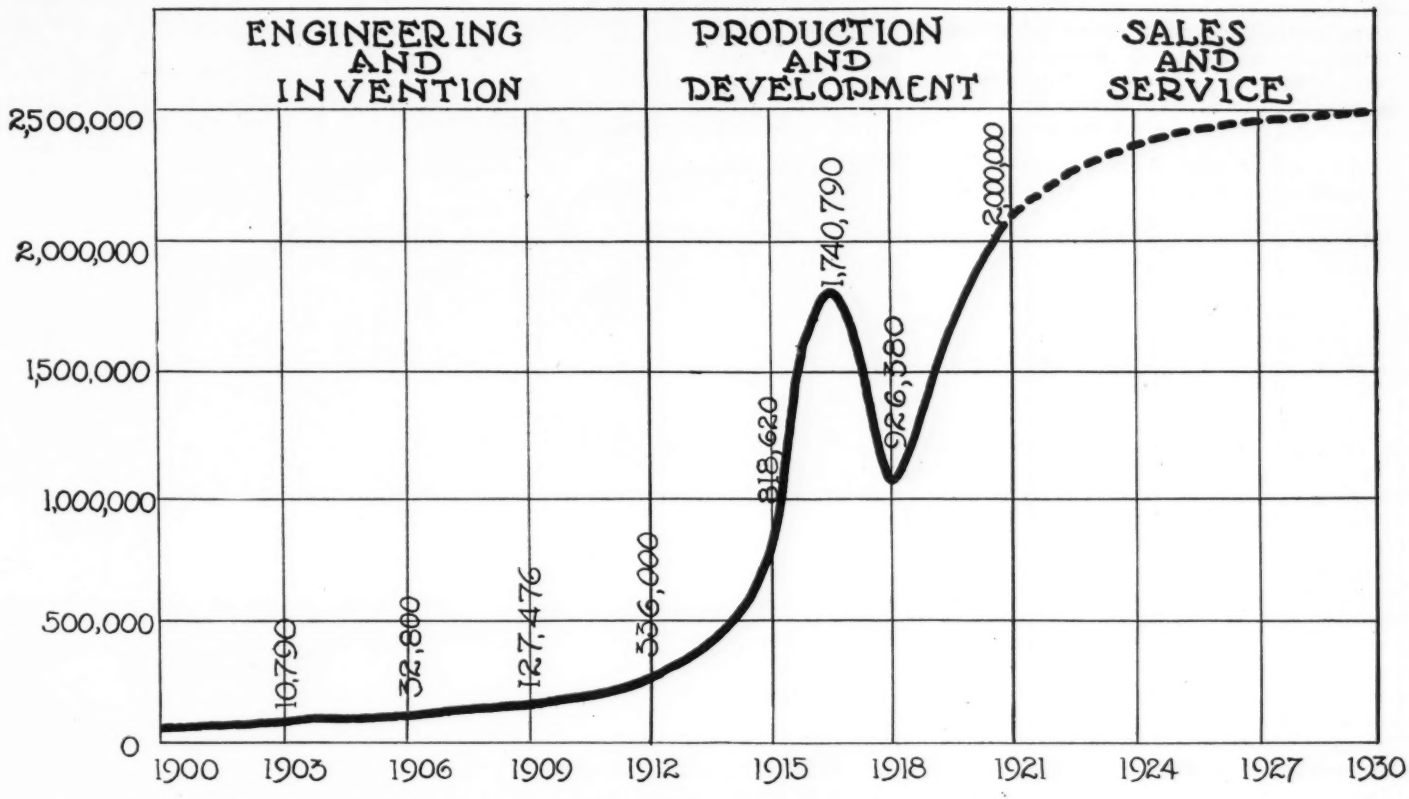
In some cases the makers have come right out and openly stated changes in their chassis or engine which would speed up service. Several others have seen the handwriting on the wall and in a subtle manner made their cars easier to serve. Thus one maker, long an adherent of the nondetachable cylinder head, this year comes out with a detachable head, realizing, no doubt, that it is infinitely easier to slip off a cylinder head for the removal of carbon, etc., than to have to remove the whole cylinder block.

One has but to look at the curve on these pages showing the increased production in passenger cars over a period of twenty years to see why the maintenance question must enter logically into the production schemes of our makers. The service curve must coincide with the production curve, which has its materialization in designing and building the product for the easiest possible methods of service, as well as in the efficient service organizations of motor car dealers wherever the cars go.

The dotted line in the curve shows how



Here is another view of the Coliseum interior looking south from the balcony exhibits. The shrouded car in the foreground is the $10,000 Packard which was unveiled at the opening of the show and was one of its features



Curve showing the rise in production of American passenger cars over a period of 20 years. The dotted line shows the possibilities for production in the years to come. Maintenance of the product must keep pace with this curve and one of the gratifying things at the Chicago show was to see how the new models gradually are being designed and built for better service. One has but to look at this curve to see why this is necessary

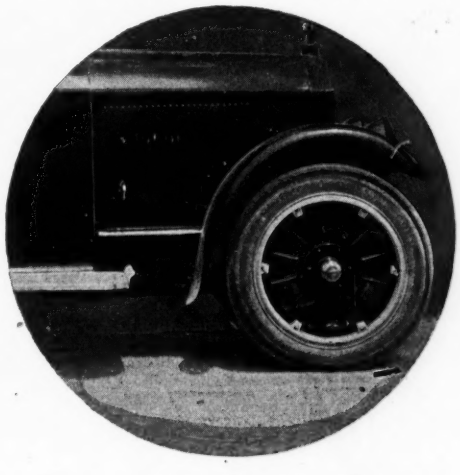
the production figures may rise up to the year 1930, when some estimates have it we shall be turning out in the neighborhood of 2,500,000 cars annually. All of these cars must be serviced and it is interesting to note in what manner the manufacturers are beginning to tackle the problem, as evinced by the cars at the Chicago show, together with other display features like the Marmon service exhibit where two mechanics perform the feat of tearing down and reassembling a Marmon 34 engine in a little more than an hour. It offers an excellent example of where a maker has studied the service question in getting his product easy to maintain. In previous years it would have been a day's job to tear down and reassemble an engine.

In former years it was the custom for most dealers to evolve repair shop methods of their own in order to speed up service. The makers' thought then was for the most part in getting out cars and left it solely up to the dealer's service department to get along as well as it could in caring for the product. But we again are seeing changing times in the industry. The makers not only are working towards getting simpler constructions and more accessible units, but are evolving service method in the factory in order to hand them down to the dealer establishments.

Service has been improved not only in the brand new models, but in current models and while some of these did not stick out in a glaring manner they were there just the same. Easier to serve as a term applied to cars does not necessarily mean that it is going to be an easier job than formerly to get at a certain part, but means also that the maker has so built his car that certain service work is eliminated. Thus a cleaning up of the chassis means less parts to get at, no grease cups to turn down, fewer brackets to keep tight, and many other things.

Some Examples at Chicago Show.

In order to get the full significance of the many items relating to the betterment of service as brought out by the Chicago show it is well to take some concrete examples of what has been done during the last year in the industry. For one thing everyone will admit cars are better built than ever before. An indication of this is seen from the display of cars in the Colesum annex, where formerly it was the custom to put what might be called inferior cars, the pick of the field holding forth in the main building. At this year's show the annex holds a collection of cars fully as good as those in the Coliseum or Armory. Why? Because makers know that they must have a good product to stay in business. And practically every maker is striving to improve his product. The better workmanship on cars together with better steels and other metals would have boosted the prices, even if the country was not going through a period of unrest following the war.



The new National Sextette is made with a gap between front fender and running board, which makes it possible for a mechanic to get closer to the engine

The designer, parts maker, engineers, service managers, in fact all men connected with various phases of the industry all have had a hand towards the betterment of the product and it is interesting to see how this was done on some of the models exhibited at the show. Take for instance the question of vibration, which always has been detrimental to certain chassis parts. On many of the cars parts like the splasher plates between engine and frame have been ribbed to prevent vibration and eliminate the drumming noise often produced. The metal used may be just as light as formerly, but is made twice as strong by the ribbing. The same

is true of crankcases on some engines. The walls have been ribbed to prevent vibration and liberal fillets used to strengthen the corners. This means elimination of certain service work arising from cracked metal parts.

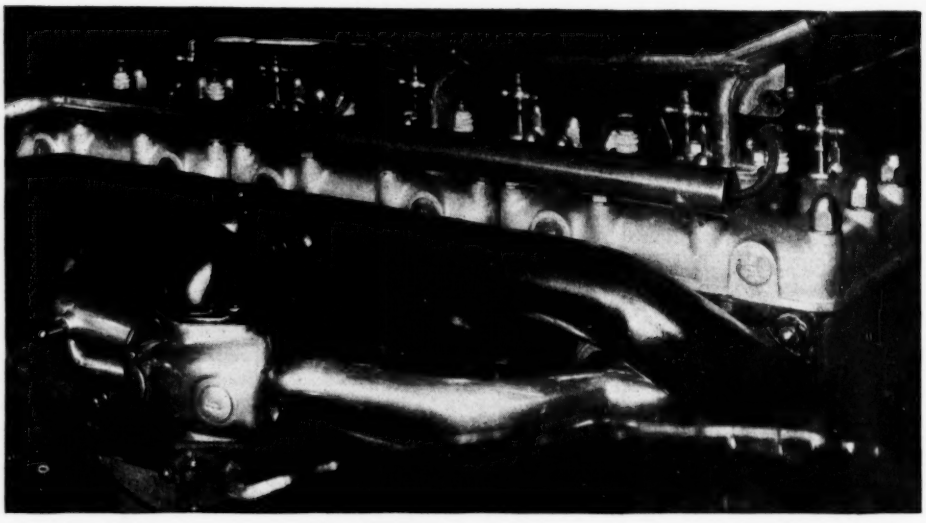
The use of wide fenders and running boards makes it hard to get to the engine on some cars, so the new National Sextette has been made with an idividual front fender and the front end of the running board cut off about 9 or 10 in. This gap affords plenty of opening for a mechanic to get close to the engine wthout being uncomfortable from having to lean over a wide fender.

Another refinement is found in the Nash engine, where the spark plugs now have been placed on the right side, where the distributer is and formerly was placed. This puts the plugs in a more accessible position and gets them away from the heat of the exhaust manifold. It shortens up the wiring and makes a better job all around. Still another refinement on this car consists of stiffening the brake drum on the propeller shaft by a flange, which tends to keep ti concentric. Brake bands will require less attention when working on a concentric drum.

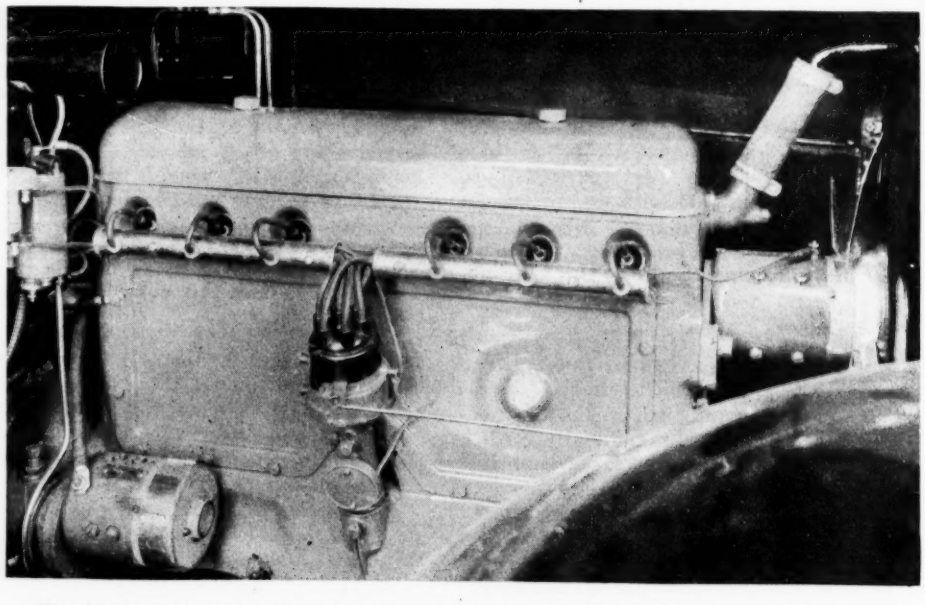
Winton Has Detachable Cylinder Heads

Winton which up to this time always has used a six-cylinder engine with the cylinders cast in pairs and with solid heads is showing this year an engine having detachable aluminum heads on the three sets of cylinders. It formerly was quite a job to get at the combustion chambers and valves inasmuch as the manifolds and all other exterior fittings on the blocks had to be taken off. Now the heads can be removed by simply undoing the hose connection on the water pipe and removing nine hexagonal nuts. The engine remains of the L-head type as formerly.

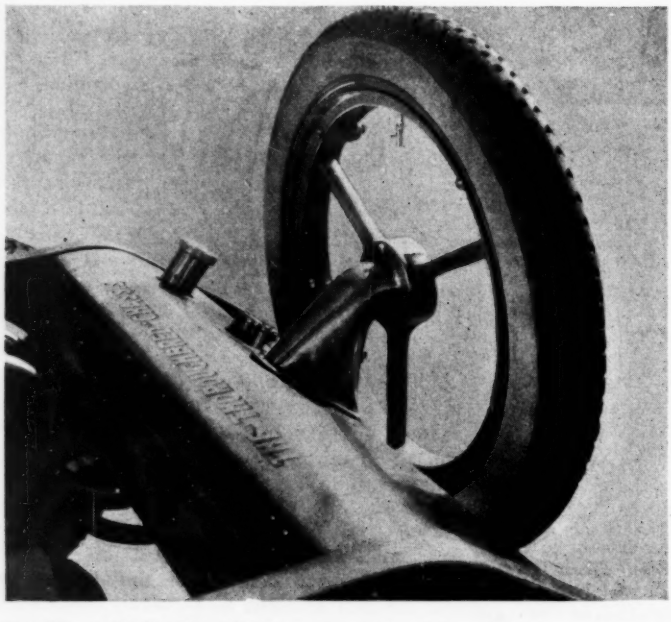
Considerable more attention has been

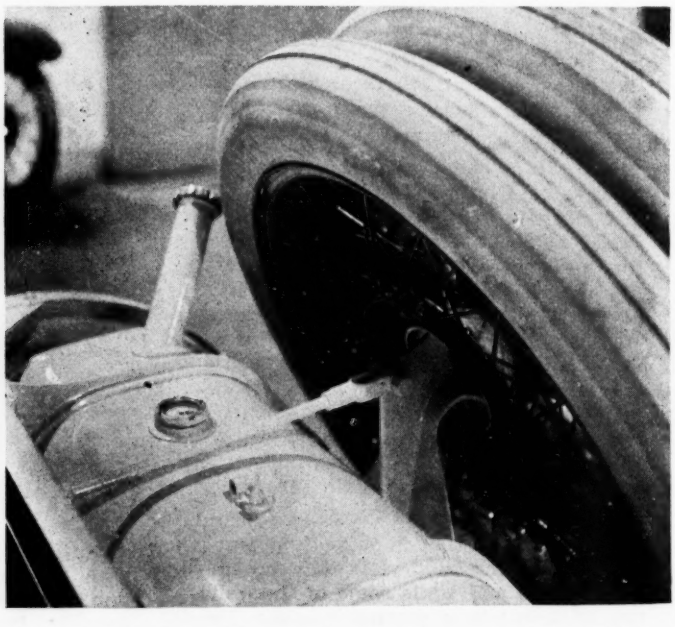


Detachable aluminum cylinder heads on the Winton engine, which formerly had solid head cylinders cast in pairs

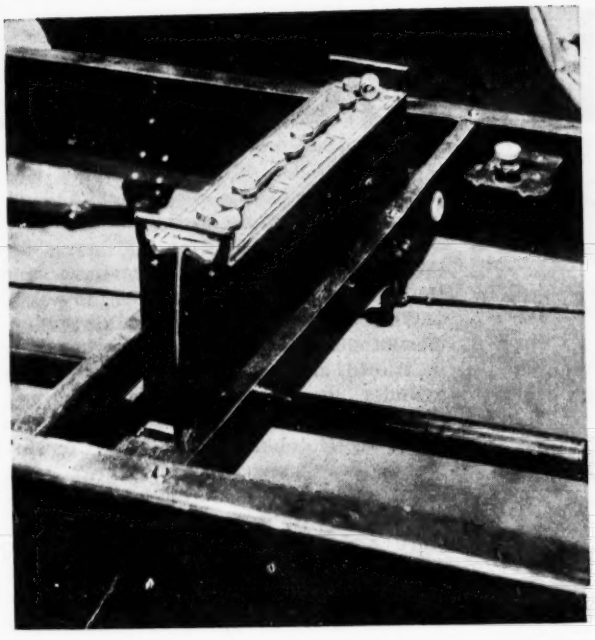


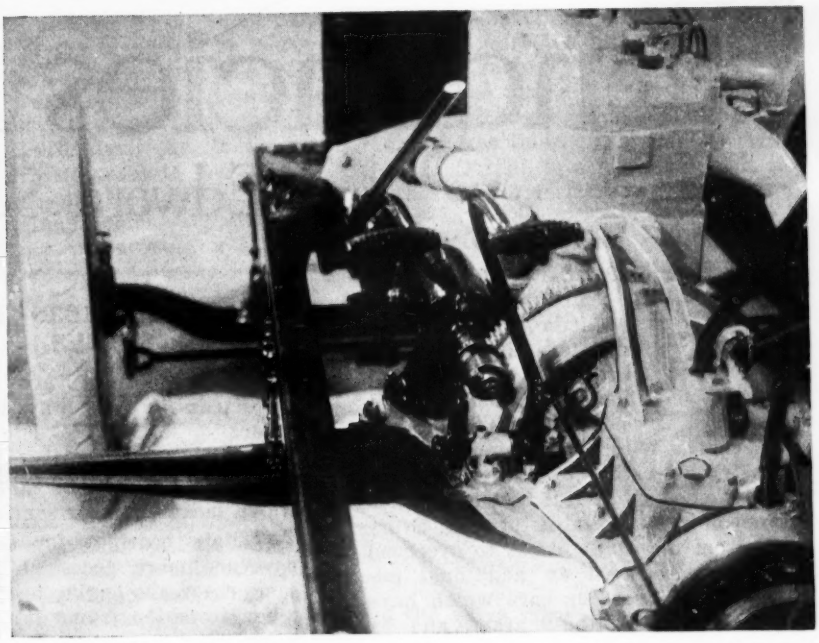
The Nash engine now has the plugs on the right side, which makes them more accessible and shortens the wiring



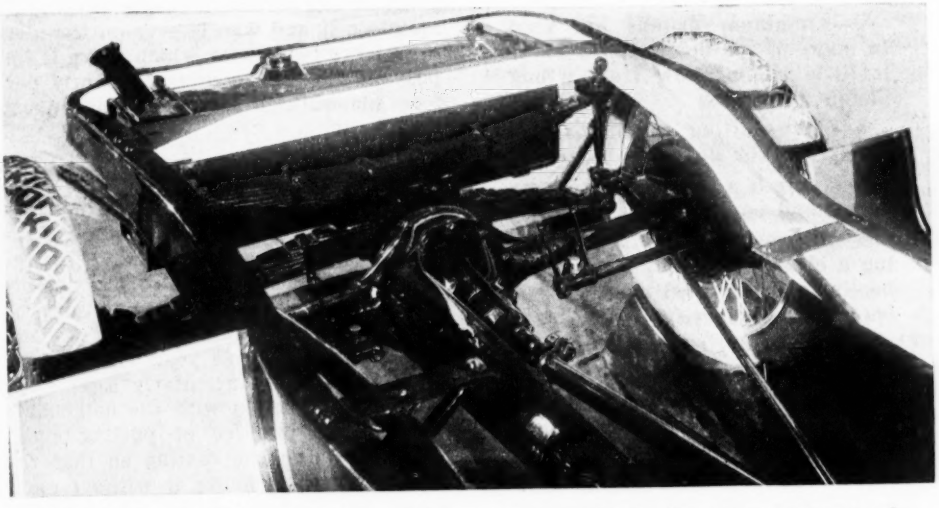


The method of attaching spare wheel brackets is getting more and more attention. Here are shown the methods used by Roamer and Lexington. Note the steel apron on the latter, which stiffens the layout materially.

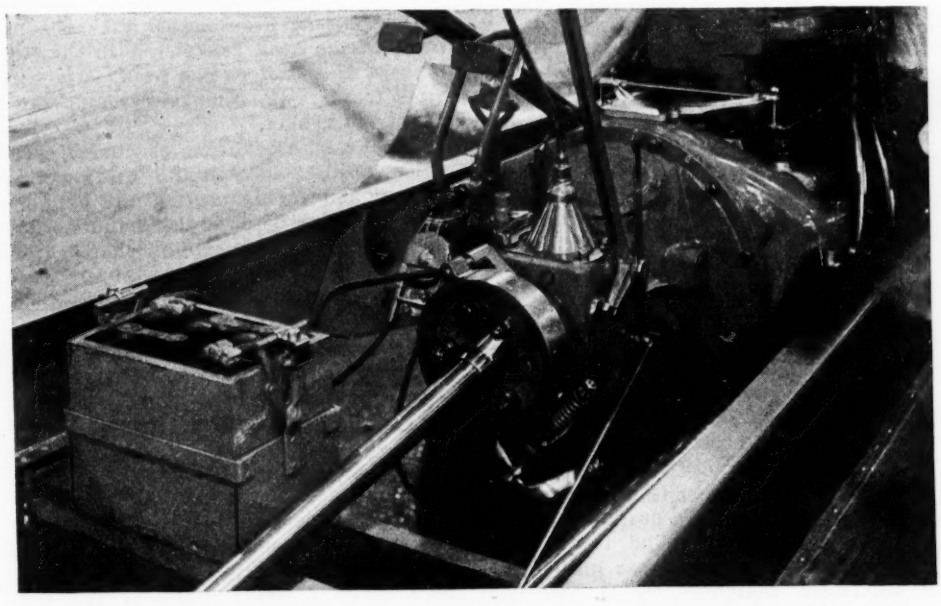




Two refinements on the new Briscoe which tend towards easier maintenance. One view shows the channel cross member which carries the battery; the other the combination running board support, cross member and engine support



The rear chassis layout of the new Saxon, showing the double cross springs made accessible for graphiting by removal of the tonneau floor boards and rear seat



On the Lexington the battery is carried on two L-iron cross members bolted to the frame. Note also the brake cable which automatically equalizes brake wear

paid to the method of supporting the spare tire and rim, or wheel on the rear. This has been, up to the past few years, one of the sources of constant trouble and very often additional trouble was set up from the fact that loose gasoline tank brackets would result, if the latter happened to be a part of the assembly. It is quite common now on cars to find a heavy sheet steel plate riveted between the rear frame horns, protecting the gasoline tank and in addition affording a surface for attaching a single bracket to hold the wheel or tire. Examples of this are found in the Lexington, Stearns, Paige, American Six, and Cleveland. This form of construction not only adds strength, but makes the car look more massive. Where spare wheel brackets are riveted or bolted to a cross member on the frame, they are sometimes reinforced by a stay rod running from a forward cross member to the bracket, as on the Roamer. This materially helps the bracket support the weight, and takes all bending stresses off the bracket where it is attached to the cross member.

Storage Battery Given Attention

More attention is being paid to the manner of carrying the storage battery. There is still, however, room for improvement on many cars, especially where the battery is suspended in a band iron cage from one of the side channels of the frame. These flimsy constructions, owing to road shocks and vibration are easily damaged. A good example of supporting a battery is that of the new Briscoe. Here a trough-like cross member of the frame is utilized in which to carry the battery, the latter being directly under the front seat. Several large holes are punched in the bottom of the cross member for drainage of water or acid from the battery. On the Lexington the battery is carried on two L-section cross members suspended from the frame side rails. Another feature of the Lexington regarding

(*Continued on page 78*)

Tendencies In Design

by J. Edward Schipper

SINCE the 1920 cars are the first real post-war products, the tendencies exhibited this year are of particular interest to those who study the development of automobile engineering. With this in mind, it is particularly interesting to note that there is not a tendency of 1918 and 1919 which has not been accentuated for 1920. Every trend from increased prices to overhead valves has received an additional impetus by the post-war cars which have just been put on the market, and by the refinements which have been incorporated in models announced earlier in the year.

One of the most important and at the same time most promising situations which has ever come about in the industry confronts us today, when we make a study of the cars and see that without exception manufacturers have improved their products. Manufacturers are making betters cars in every way than ever before. Design, material and workmanship are all superior than they have been at any previous time during the history of the industry and everything points toward a continuance of this happy tendency.

Quality Is Now Demanded

It has become a well recognized fact among manufacturers that in order to remain in business, they must have a superior product. It is possible to design and build a car for a price, neglecting the qualities of life, endurance and general satisfaction, and perhaps to apparently make money for two or three years, but the sudden drop in sales and the shrinkage in the valuation of the investment becomes so rapid after this period that it is not worth while for a manufacturer to attempt to do business on this basis. The result is that there is not a manufacturer who does not realize that he must start out with a good automobile, regardless of any other consideration.

With this thought in mind, the tendencies of the year take on an added interest, and we see how they fit into this general scheme of producing a better car even if that car is compelled to sell for more money. Although the average price of all automobiles is $200 more today than it was a year ago, we find that this increase is not all chargeable to labor and material. A great amount of it is chargeable to better workmanship and materials of better specifications than those bought for similar cars a year ago. In fact, the better methods of production in use today and the more complete machine equipment of the factories would have tended to lower prices, or at least absorb a great amount of the increased labor charges, had not the better qualities of the product been a material factor in causing the increase.

While not many years ago it was probably correct to say that a great percentage of American cars were designed first with the price thought in mind and afterward the best possible product that could be produced for that amount of money, the situation is now reversed, and although the car is designed with a probable price field in mind, the definite price is not fixed on the car until after it has been designed, tested and improved sufficiently to secure the endorsement of the engineering department and the manufacturing executives..

While there are fundamental tendencies of design which year by year may be traced, such as the trend toward six-cylinder cars, valve-in-head engines, vacuum fuel feed, pressure oiling, disk clutches, Hotchkiss drive, unit power-plant, etc., which year by year have given a marked indication of the direction in which progress is being made, there are a number of other improvements which are probably even of greater importance to the user and the man who keeps the car in condition, than these tendencies.

We are practically interested in the improvements in the car from the standpoint of the service manager, who must maintain it and who is ever on the alert to observe tendencies which make it impossible for him to more efficiently perform his work in the repair and upkeep of the car.

Serviceability Receives Attention

Probably the most significant improvement and tendency in engines from the repairman's standpoint is that of the detachable head engine. This is notably on the increase, and in fact, it may be stated that there has not been a new engine brought out this year which is not of this type. A particularly interesting detail in connection with the detachable head is the practice of putting small lips or lugs on the casting so that the repairman may remove it without damaging the gasket. With the ordinary flush type of top it was necessary to use a cold chisel to start the head after the studs had been removed, and this in every case necessitated the replacement of the head gasket. With the lips or lugs now cast on the head, it is possible to start its removal without damaging the gasket.

The detachable head, of course, provides greater accessibility for cleaning carbon and for inspecting the cylinder bore. It also permits the manufacturer to machine the combustion chamber internally, thus securing absolutely even compression in all. With the overhead type of valve in connection with the detachable head, the entire valve assembly and rocker arm units are removable together with the head in a great many of the new types, making it possible to work on a bench where the light is better and where it is easier to use the desired tools.

In connection with the valve-in-head engine, some new ideas have been brought forward this year and incorporated on a great many of the new phoducts. This particularly refers to

WHAT THE 1920 TREND SHOWS

1—Manufacturers are making better cars in every way than ever before

2—Every new engine brought out this year has a detachable head, which means quicker service

3—Main bearings for the most part are more accessible and in some cases, the engine need not be taken from the frame for bearing work

4—Oil pumps on practically all engines now can be removed from the outside

5—Aluminum pistons are used in many of the new models. There is little trouble now from wrong piston clearances

6—Hot spotting manifolds has received much development work

7—There is a tendency for larger valves and ports

8—Die cast bearings are effecting a change in repair work. Connecting rods so fitted must be sent back to the factory for replacement

9—Sixty per cent of the car makes are using a dry-plate clutch

10—Several of the newer cars are using torque members in place of Hotchkiss drive

11—Aluminum alloy metals offer possibilities for axle housings, wheels, etc., to reduce unsprung weight

12—There is an increase in the use of transmission brakes, resulting in a general cleaning up of the chassis design

the use of an open sided cylinder casting on the side on which are located the valve rods. An aluminum cover plate is put over the open side, which extends down into the crankcase, thus providing a clear opening from the head down to the case, allowing the oil spray to be thrown up to the overhead valve mechanism, and permitting it to operate in an oil mist. The criticism of noise which was generally directed against overhead valve engines a few years ago, has been distinctly overcome in these new models. This construction is used on the Harroun car, which has just been refined.

Some unusually accessible features in connection with the main bearings as regards work about the crankcase may be seen on quite a few of the new cars. Particular attention may be called to the new Lafayette car, which uses four-point suspension in order that the timing gear cover may have no work to do in connection with the suspension of the engine and thus be readily removed to reach the timing mechanism. The crankcase on this engine is in two parts so that work on the main bearing can be done without removing the engine from the frame.

Try to Eliminate Bearing Trouble

A feature on all of the new engines is that the crankshaft and the crankshaft bearings are being made so heavy that it is probable that there will be fewer cases of bearing trouble in these new engines than ever before. It is not unusual for crankshafts to run up well over 2 in. on engines of the size which formerly employed 1¾ in. shafts. Pressure feed oiling which supplies the oil in sufficient quantities to cool as well as lubricate the bearings has rendered these heavy shafts possible and by their use periodic vibration has been practically eliminated.

On practically all of the new cars it is possible to remove the oil pump from the exterior of the crankcase by removing three cap screws. This is a point which will be appreciated in cleaning out the oiling system and in overhauling the pump, particularly by those who have had in some cases to tear the engine down in order to reach the pump.

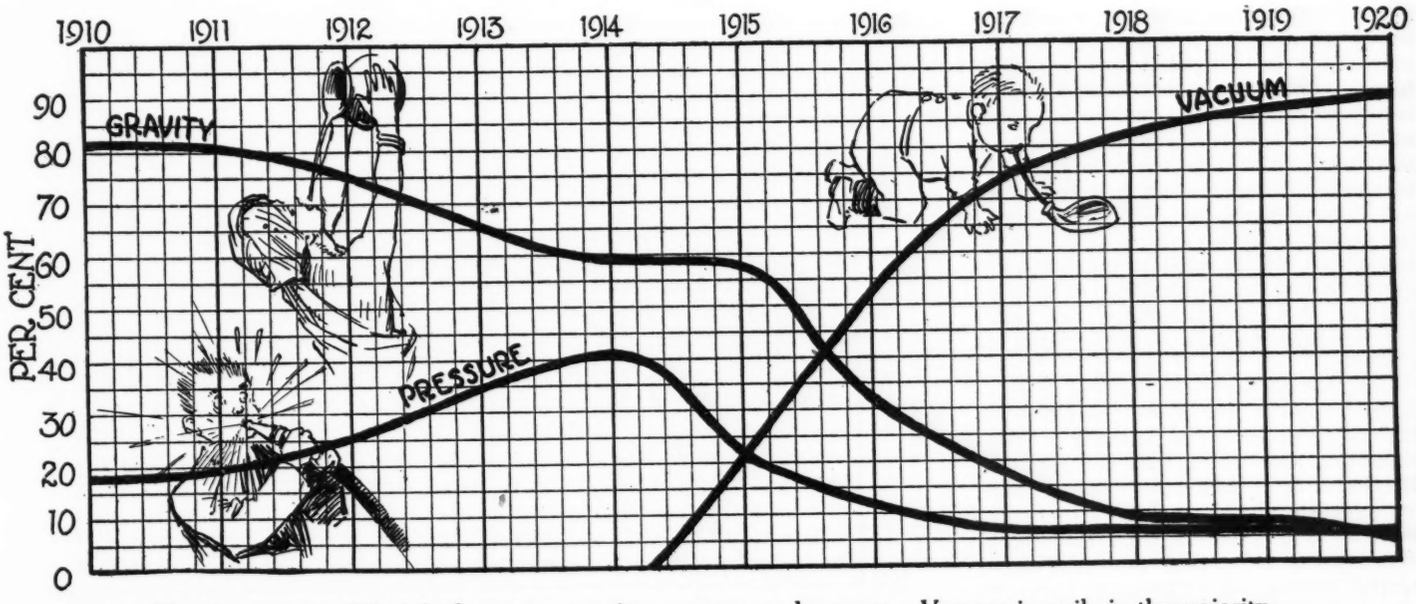
While aluminum pistons are used, they are not giving the trouble which was formerly experienced with them when it was attempted to cast aluminum pistons from exactly the same pattern as iron. It has been realized that the characteristics of the metal must be taken into consideration in manufacturing an aluminum piston and the result is that the correct clearances have now been discovered and the correct method of stiffening the piston has been utilized to the elimination of trouble. It is of interest to note that where aluminum pistons were formerly used, first for their lightness and second for their heat dissipating qualities, the situation has now been reversed and all of the aluminum pistons are of heavy section to secure the dissipating qualities, with lightness a secondary consideration. In fact, some of the new iron pistons are practically as light as the aluminum pistons. Aluminum has been used extensively by manufacturers generally this year. The new Studebaker small six has an L-head engine with the detachable part, an aluminum casting incorporating the intake manifold. This exposes the lower part of the intake manifold to the heat of the combustion chamber and assists in vaporizing the gasoline.

Marmon, on the other hand, has this year gone to iron castings in place of aluminum for the cylinder blocks. However, these castings have been so carefully designed and are relatively so light that it is estimated that there is only 50 lb. difference per engine due to the use of the iron cylinders. The Premier engine uses an aluminum cylinder casting with what may be known as the wet sleeve construction, as the cast iron sleeve fits directly into the aluminum casting in such a way that the water is between the sleeve and the casting and washes directly against the outside of the cast iron liner. This construction is used in Europe to some extent, but this is the only American factory utilizing this practice.

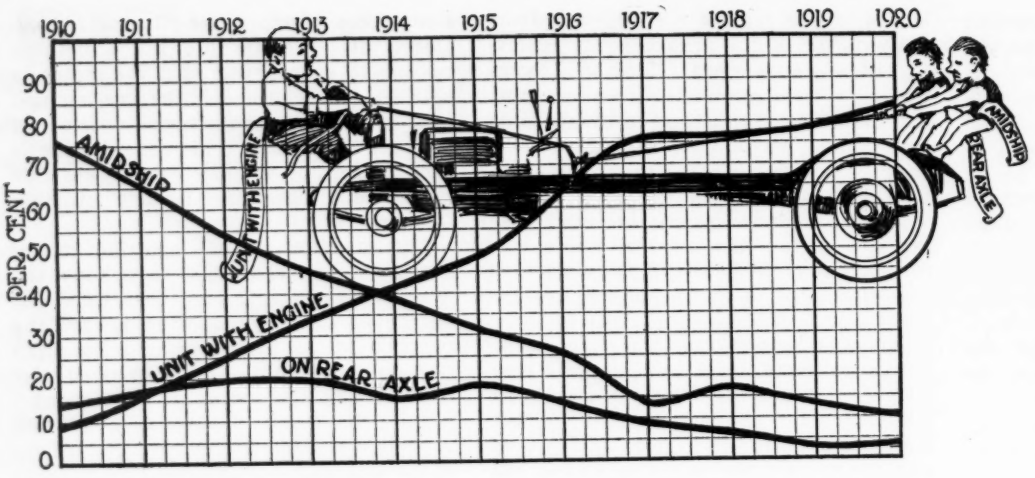
The question of hot spotting intake manifolds has continued to occupy the minds of engineers, but there has been an almost universal drifting toward the practice of so arranging the hot spot that only the liquid or unvaporized portions of the fuel come in contact with it. In the Brush design, such as that used in the new Saxon car, the inertia of the liquid or unvaporized fuel is made use of. These heavier particles have, by their own mass, sufficient kinetic energy to carry them across to the hot walls, whereas the vaporized portions pass directly into the intake passage and to the valve ports. On the new Studebaker type, the heavier portions by their own weight lie along the bottom of the intake passage, which is integral with the aluminum engine head and these are vaporized by the heat of the combustion chamber. In the new Lafayette design the intake is exhaust jacketed, and owing to the fact that the intake bridge is across the V between the engine blocks, there is a surging action of the gases to and fro from one block to the other, this giving the desired impinging effect to assist in vaporization.

Paige Engine a Good Example

Several other engine types allow the intake gases to pass across between the two central cylinders of the block. On the new Paige engine this method is utilized to advantage. The new Continental 7R engine which will be utilized in a great many of the assembled cars, possibly twenty-five at the present writing, incorporates an exhaust jacketed manifold, the intake being cast integrally



The three types of fuel feed systems, gravity, pressure, and vacuum. Vacuum is easily in the majority



The tug of war for the location of the transmission, showing the tendency toward amidship location

with the exhaust and in contact with it to a certain degree to assist in vaporization.

Some of the engine details which are particularly noticeable are the trends toward larger valves and ports, the use of die-cast babbitt bearings for the rods and main bearings, the use of chain drive for the timing gears, and more complete distribution of the oil pressure feed to different parts of the engine. Of these minor points, probably of most interest to the repairman and service manager is the use of the die-cast bearings, which make it feasible in a great many instances to return the rods or main bearings direct to the factory for replacement, unless the repairman is equipped to do his own die-casting on a mandrel. This is not an easy job to handle without special equipment and consequently this new construction will result in handling bearing repairs by replacing the entire assembly, with allowance being made for the part turned in.

Few Changes in Clutch Construction

Clutches do not show much change this year as far as construction is concerned. There has, however, been a tendency toward the adoption of the dry plate type by a great many manufacturers. Borg and Beck is used on nearly sixty makes. The number of plates utilized run all the way from three to seventeen, and with three, eleven and seventeen as the predominating number. An attempt has been made by some of the manufacturers to increase the leverage of the clutch pedal to make the car easier to handle, particularly by women, and in this respect there are some notably easy designs, Cadillac being an example.

Unit powerplant construction has remained popular, the new Studebaker being the only new car to be made in quantities this year which does not utilize it. Hotchkiss drive continues to be popular, but recently among engineers there has been some talk of dropping the Hotchkiss drive in an attempt to secure easier spring suspension. The new Lafayette car and the new Saxon, which were both exhibited at New York for the first time, have torque members. The new Lafayette has a tube which encloses the entire drive, and a triangular stay layout from the front end of the torque tube back to the outer extremities of the rear axle.

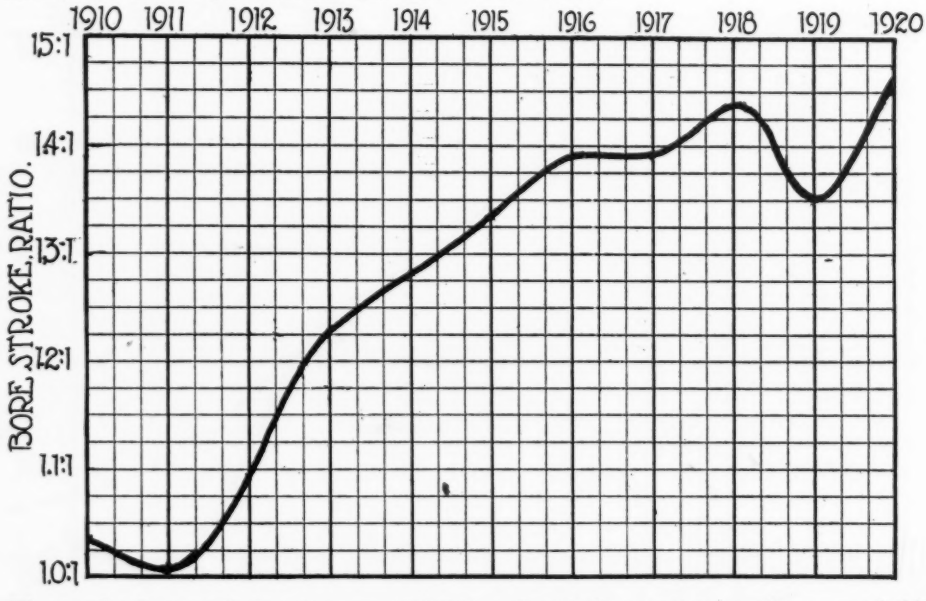
Semi-floating rear axles are gaining in poularity and there is a tendency toward redesigning the axle for lightness. Some of the newer axles haxe bearings on both ends of the pinion shaft, which tends toward stiffness and also permits of a single pinion shaft carrier which can be removed as a unit. All of the newer types of axles have very accessible adjustments for the pinions and ring gear mesh from the outside of the axles. The employment of aluminum axle housings may be expected in the near future, as the Aluminum Products Co., Cleveland, is introducing castings which are said to be satisfactory for this part of the chassis. Although this is more expensive than the present construction, it results in a material reduction of unsprung weight, which a great many manufacturers deem to be of the utmost importance.

The use of aluminum wheels is also among the future possibilities, the new castings being shown at the New York and Chicago exhibits having attracted notable interest. It is stated that it will be possible to provide wheels for a 3,000 lb. touring car, weighing but 19 lb. apiece, which of course would make a material reduction over present types, although no doubt much more expensive.

There has been some lengthening of wheelbase due to a desire to increase body room. On the other hand there have been some manufacturers who have shortened the wheelbase and yet accomplished a great deal in the bodies. The most notable instance of this is of course the new Overland four with its overhung frame. Frame side members have been deepened almost universally and the transverse members have been more firmly gusseted than ever. In the chassis oiling systems there has been an increase in the use of Alemite type of lubrication, which is utilized on a great many cars now as stock equipment. The oil cups have continued to increase at the expense of the ordinary type of grease cups. The Fergus car shown at the New York show with its centralized system of chassis lubrication excited a great deal of interest and it may be that some of the features incorporated in this will find their way into other chasses.

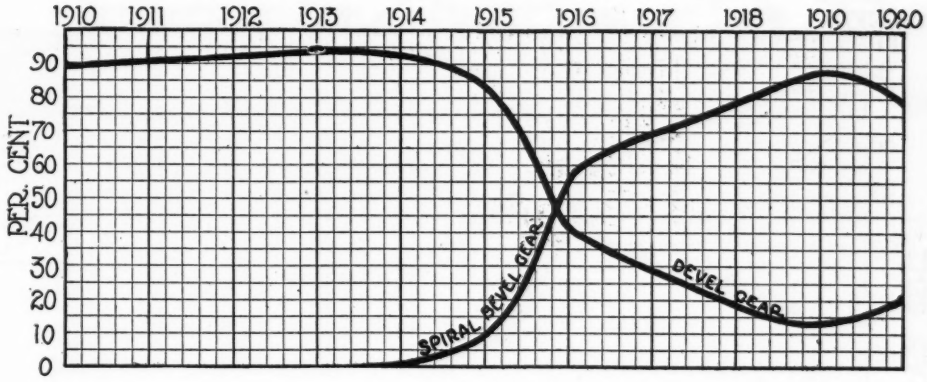
Drive-Shaft Brake Favored

Some of the new models such as the new Maxwell and a few others in about the same priced class have gone to the transmission shaft brake. Whether or not this will be a definite tendency remains to be seen. It certainly results in cleaning up the chassis and freeing it from an extra set of brake rods, and also provides an efficient brake for emergency use. In all cases where the transmission brake has been installed, it has been for the hand brake and not the foot brake.



The stroke bore ratio is going up, indicating that higher engine speeds are probable

With the detachable cylinder head it it is possible to machine the combustion chambers, thereby securing absolute equality in volume for each cylinder and consequently much more regular performance. The compressions are, of course, much more uniform and this, taken in connection with the fact that there is great deal better distribution of the gases because of better manifolding, leads to a much more even running engine. In fact, there is little doubt but that the even running and absence of vibration in the latest engines is as much due to this equality in the combustion chamber as it is to any other cause.



The type of final drive showing the popularity of the more expensive spiral bevel gear

Cars Free from Vibration

This freedom from vibration which is a growing characteristic of American cars is very important. The life of an engine is just about in proportion to its freedom from vibration. The use of vibration dampers on American cars has not grown rapidly, as we have sought to eliminate the period rather than the effects of it. The latest type of Lanchester damper, in which a train of gears revolves opposite to the shaft with counterweights to overcome the distorting tendencies, has been introduced on one or two American makes and may become more common. The main relief from vibration has been secured through the use of shafts which run up well towards 2¾ in. diameter.

On some of the newer cars, notably the Lafayette, there has been a very marked tendency towards the use of lighter hollow parts in place of the heavier solid sections. Tubular construction has proven itself reliable and rigid and at the same time provides a ready path for the lubricant through the center of the tube. Tubular crankshafts and camshafts will probably be more common in the future than they are now. This tendency in combination with that of using aluminum forgings for the rods is going to have the effect of materially reducing the weights of engines. The reciprocating weights, which have been studied for years, seem to be in the way of a cut that is more radical than any made in the past decade.

Larger valves and valve ports continue to make their appearance. We have about reached the limit on these, however, as far as present tendencies are concerned. The increase in port area means a reduction in gas velocity with the result that starting and running on lower speeds becomes more difficult. The higher the velocity of the gas the simpler the problem of carburetion.

Engines Are Smaller

Reviewing the engine trends as a whole, it is obvious that the basic idea behind the changes which are now being made, is that greater output is desired from smaller displacement engines. In other words a higher torque-weight ratio is sought. It is this ratio which is a direct measure of the accelerative ability and the hill climbing ability of a car. When a smaller engine is used with a higher output, a big step is made in the direction of increasing the ratio as the smaller displacement engine is naturally lighter and in turn requires a lighter chassis and very often makes possible the use of a shorter wheelbase, which results also in a lighter weight car.

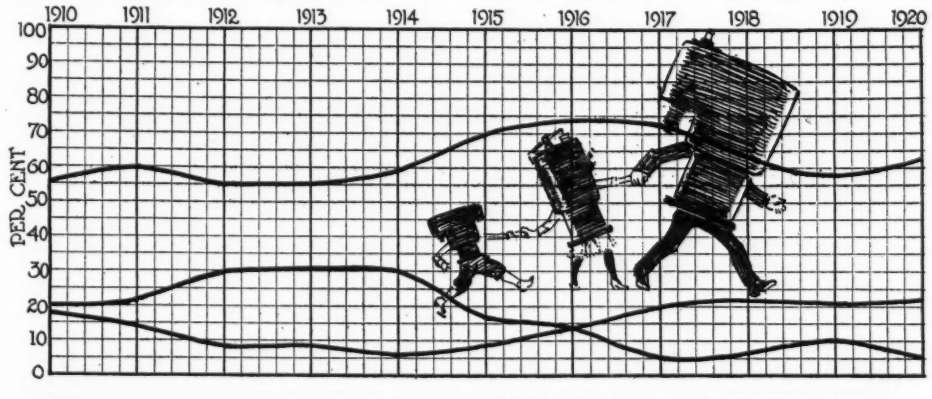
Conteracting this tendency we find that some of the manufacturers have lengthened their cars for the purpose of securing more room in the body. The added room is being utilized both in the front compartment and in the tonneau. There is no denying the fact that front compartments are more accessible than they have ever been and they will probably be still further improved. The use of the tilting steering wheel to allow the driver to enter and leave the front seat is a great help. The tilting wheel provides an opportunity for an effective lock which is utilized by some.

A great amount of space has been gained in the body by the use of shorter powerplants. There are a great many kinks in designing an engine to make it shorter. This is particularly true of the fan bracket and drive arrangement which if not carefully handled can use up a valuable inch or two in hood space that could be placed in the body to better advantage. The new Saxon engine is noticeably short, this being particularly so on account of the two-bearing crankshaft. While using only two bearings, one of the greatest claims of the Saxon company is the life of the bearings due to the use of a special lubricating system, in which the bearing floats on an oil film confined in such a way that the oil cannot escape from the bearings.

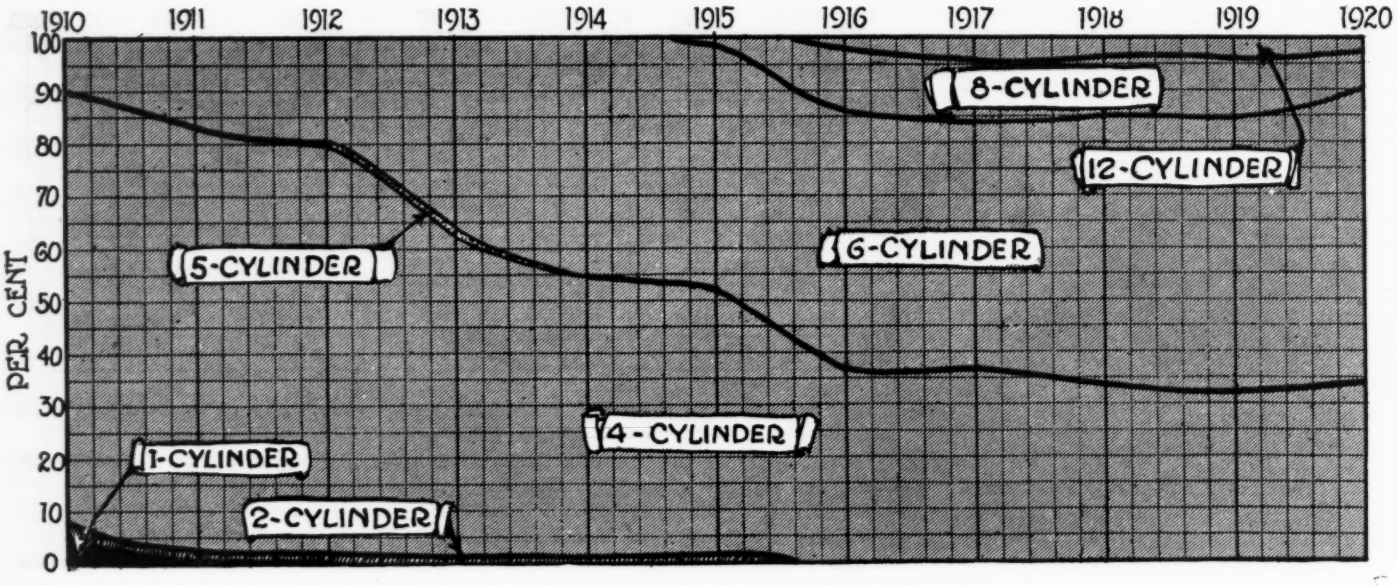
Lubrication Is Improved

Pressure lubrication and special methods by which a large quantity of oil is fed under high pressure have increased notably. Perhaps this is one of the lessons we have learned from airplane practice. On some of the newer cars the connecting rods do not dip at all and on a great many that do have the rods dip, it would make little or no difference because the spray from the lower rod bearings due to the pressure under which the oil is fed through the hollow crankshaft would take care of the cylinders.

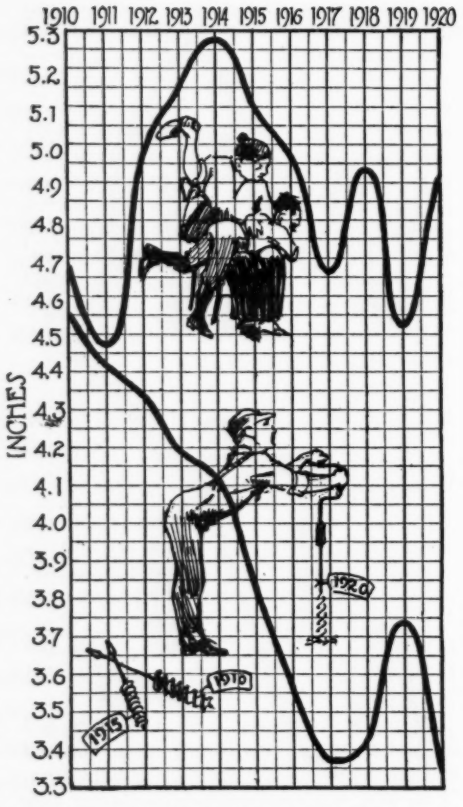
Oil under pressure, provided it is fed in sufficient quantities, has a marked cooling tendency as well as lubricating. Thas has made possible the large size crankshafts which are now being employed. It used to be thought that a bearing speed of 1,000 feet per minute was about the limit. As the diameter of the shaft increases the linear speed goes up correspondingly and the result is that unless unusual precautions are taken with the lubrication, the bearings would soon be worn away. The new systems permit of the large shafts and have practically eliminated bearing trouble. Also, they have for the same reason eliminated vibration because they have permitted of shafts which are so stiff that they cannot distort and consequently do not have the periods which are so annoying.



The family of cylinder heads is led by "Mr. L-Head," greatly in the majority



An area curve showing the progress of the cylinders



The bore is decreasing while the stroke increases

There are a great many little kinks in the lubricating systems which prevent the oil from being worn out as rapidly as it would under ordinary circumstances. One of the most ingenious of these is the use of a device on the new Lafayette car in which the oil is prevented from circulating except that part of it which is in use. This is accomplished by placing the pressure relief valve in unit with the pump in such a way that all the oil which passes through the relief drains back immediately to the crankcase and does not uselessly circulate. In this way only the oil that is really used for lubrication goes through the wear and tear of the circulating system and the effects of the careless owner who does not renew the lubricant as often as he ought to, is nullified.

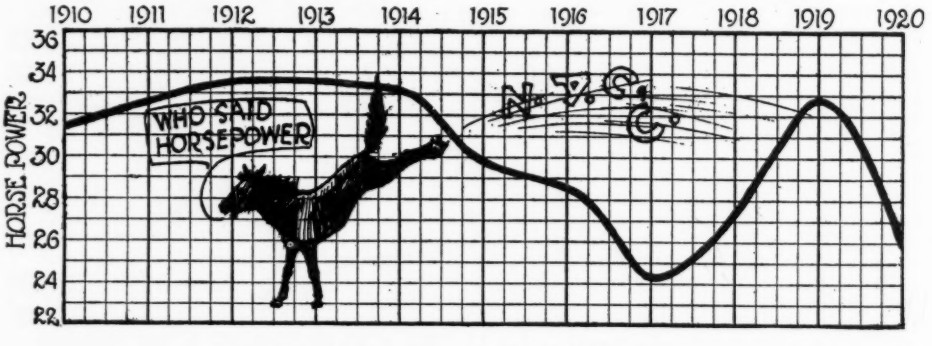
The oil is more frequently led directly to the point at which it is needed than it used to be. On some of the newer cars we see lubricating leads direct to the camshaft bearings instead of allowing the bearings to be taken care of by splash, as formerly. This is also true of the timing gears, where there are independent leads which allow the oil to flow directly on the gears or chain and so tend to keep this vital part of the engine quiet. There is a notable tendency towards the use of silent chains in the camshaft drive and where the chains are not used we find an increase in the use of the non-resonant materials such as Fabroil, which is a compressed fabric very useful for the purpose.

If we were to look ahead and venture a prediction on what will be done in engine practice and in fact throughout the car, it is safe to say that all of the present tendencies will continue for a while. The number of overhead valve engines is going to increase. The ranks of the V-type engines will be shortly augmented by some newcomers. The newer cars are almost sure to be nearly all in the higher priced class and consequently will be products of fine equipment and workmanship. The standard of workmanship in the automobile manufacturing business has risen perceptibly since the war, and it is very well possible that the government inspection system with its close limits at which we all grumbled when first compelled to put up with it, might have been a good lesson for us.

It is certain that from a manufacturing standpoint at least the cars are being built and will be built to closer limits than ever. It is not that greater care is being used so much as that by improved methods of manufacture and the better use of jigs and fixtures, it is commercially possible to manufacture to limits which as one time would have been considered ridiculously small and in fact impossible from a commercial standpoint. We are turning out as production jobs today, cars which would have been considered almost tool-room products a few years ago, and the best part of it is, that these cars are absolutely interchangeable.

From the standpoint of the man who operates a service station there are a great many improvements which he appreciated. One of the foremost of these is the ability exhibited by some of the manufacturers to make the same part act for several places. For instance, in the new Briscoe there are a number of notable achievements which enable a

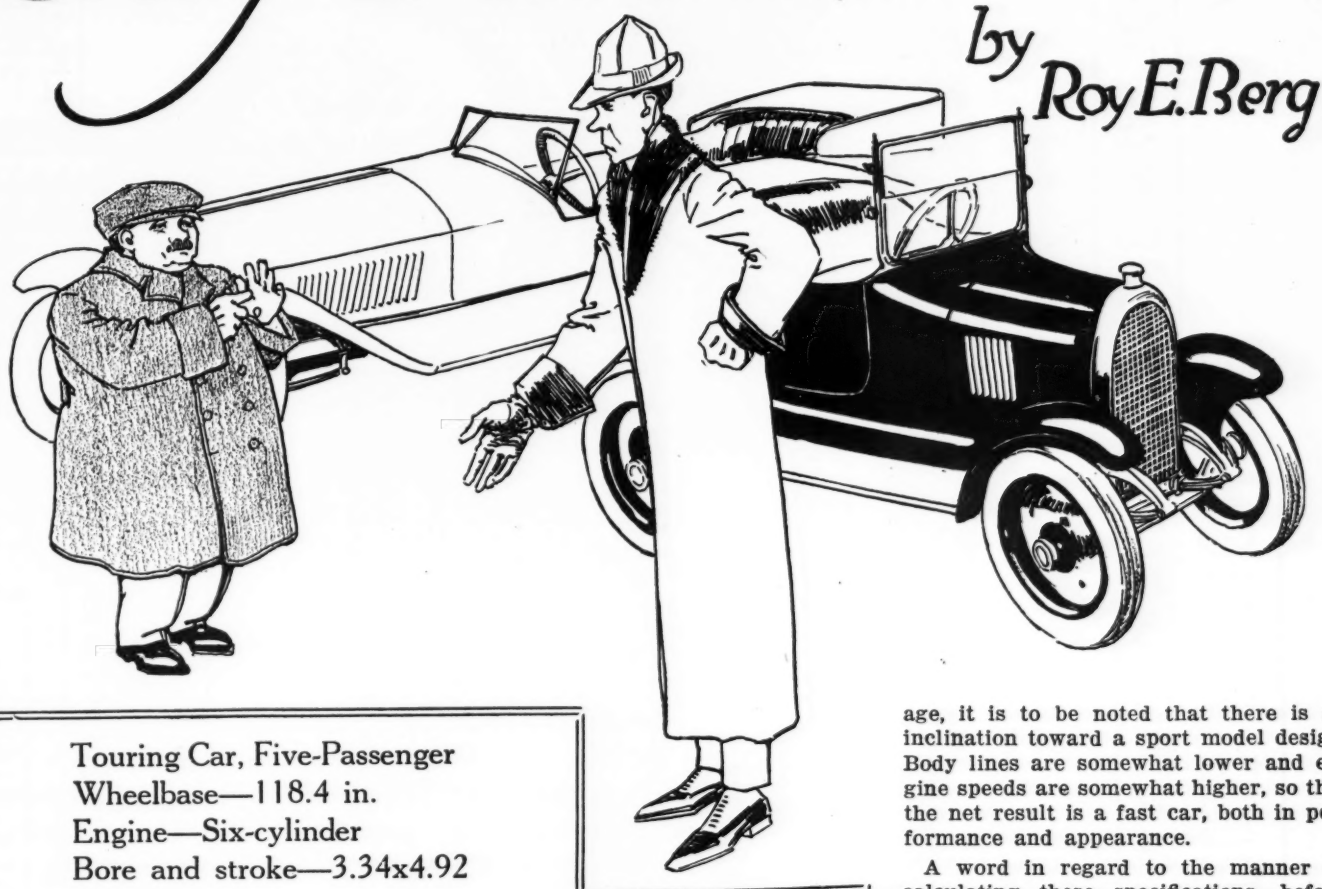
(*Continued on page 23*)



Rated horsepower is coming down

The AVERAGE CAR

by Roy E. Berg



Touring Car, Five-Passenger
Wheelbase—118.4 in.
Engine—Six-cylinder
Bore and stroke—3.34x4.92 in.

Stroke bore ratio—1.47:1
Horsepower—50.1 at 2375 r.p.m.
Camshaft drive with helical gear
Oiling system — Force and splash; oil pump driven from cam on camshaft
Disk clutch (dry plate)
Three-speed transmission
Floating rear axle
Drive through spiral bevel gears
Hotchkiss type drive
Rear axle ratio—4.23 to 1
Car weight—2995 lb.
Price $2410

AMERICA'S Average Car, a composite of the post-war designs offered to the public for 1920, is presented herewith complete in all its details for the tenth consecutive year by MOTOR AGE.

A thorough comprehensive study of the car designs of 1920, reveals above all that quality and workmanship is more than ever becoming of paramount importance. Accuracy of machining and ability to perform under the most severe conditions is being demanded by the manufacturer of the product which bears his name.

The Average Car designed from the average values of the technical specifications of 551 car models presented on 143 chassis by 122 makers, reveals the fact that the cars are tending toward a smaller design, which includes wheelbase and engine size, with the consequent reduction of operating expense. Price, however, is going up, and it is probable that the average price of $2,410 is too low, for announcements of price increases are matters of every day occurrence.

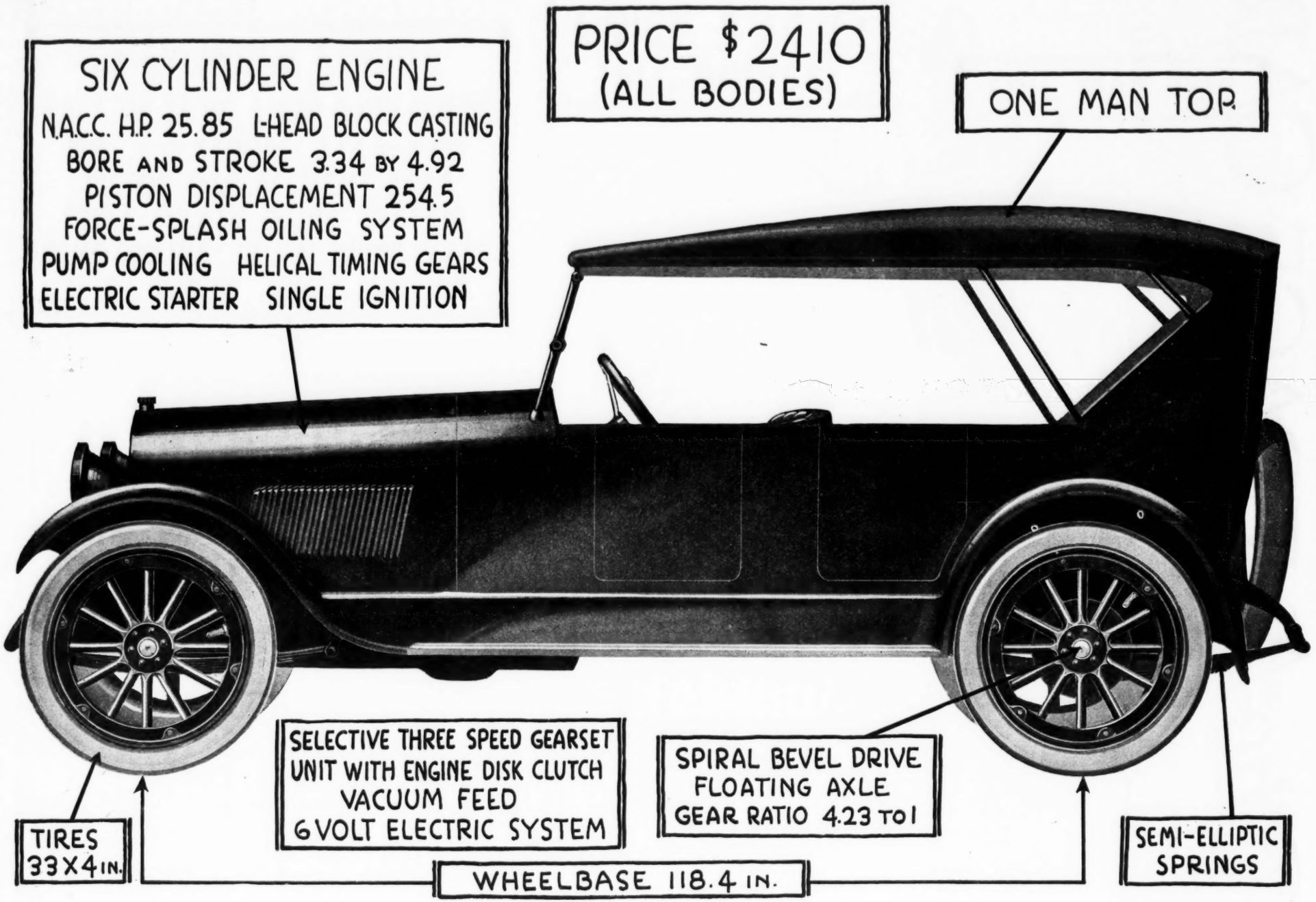
Price is $2,410

On the next page will be found a reproduction of the Average Car in the proportions that the calculated values of the specifications give it. Lines and contour are pictured to represent the conservative. But, although this reproduction is a fair estimate of the average, it is to be noted that there is an inclination toward a sport model design. Body lines are somewhat lower and engine speeds are somewhat higher, so that the net result is a fast car, both in performance and appearance.

A word in regard to the manner of calculating these specifications, before taking up the car in detailed form. Obviously there is but one way to arrive at a representative average design, and that is by computing the averages from the number of chassis models. If the averages were calculated on the basis of production we would have a car so close in resemblance to the small cars with four-cylinder engines that further comparison would be needless. It should be remembered that of the 2,000,000 cars made during 1919 (the figure of 2,000,000 arrived at by estimation of reported production) at least 1,250,000 of them are under 109 in. wheelbase and have four-cylinder engines. So, our average car is the result of a composite average of the number of chassis models.

Six-Cylinder Engine

In brief, the mechanical make-up of the car is as follows: A six-cylinder engine, whose power is transmitted by a dry disk clutch to a three-speed forward and reverse transmission, both of these units being in single assembly with the engine. From the transmission the power is delivered to a universal joint directly in back of the transmission to a hollow propellor shaft, to the second universal joint just in front of the rear axle. From here, the floating drive shafts receive their power from a spiral bevel pinion and ring gear, fifty-seven per cent in the majority. Wood wheels are used and the tire size is 33 by 4 in.


SIX CYLINDER ENGINE
N.A.C.C. H.P. 25.85 L-HEAD BLOCK CASTING
BORE AND STROKE 3.34 BY 4.92
PISTON DISPLACEMENT 254.5
FORCE-SPLASH OILING SYSTEM
PUMP COOLING HELICAL TIMING GEARS
ELECTRIC STARTER SINGLE IGNITION
PRICE $2410
(ALL BODIES)
ONE MAN TOP
TIRES
33X4 IN.
SELECTIVE THREE SPEED GEARSET
UNIT WITH ENGINE DISK CLUTCH
VACUUM FEED
6 VOLT ELECTRIC SYSTEM
SPIRAL BEVEL DRIVE
FLOATING AXLE
GEAR RATIO 4.23 TO 1
SEMI-ELLIPTIC
SPRINGS
WHEELBASE 118.4 IN.

Contrast of Average American Cars for 10 Years

GENERAL AVERAGES

	1920	1919	1918	1917	1916	1915	1914	1913	1912	1911	1910
Horsepower, N.A.C.C.	25.85	32.94	27.4	24.3	28.66	29.97	33.2	33.60	33.60	32.7	31.55
Bore	3.34	3.74	3.43	3.37	3.57	3.82	4.12	4.19	4.34	4.42	4.58
Stroke	4.92	4.52	4.94	4.66	4.97	5.10	5.28	5.15	4.97	4.46	4.61
Stroke-bore ratio	1.47-1	1.30	1.44	1.38	1.39	1.33	1.28-1	1.23-1	1.09-1	1.01-1	1.03-1
Piston displacement	254.5	261	269	222.5	278.87	307.38	349	345	316.2	313.2	281.5
Wheelbase	118.4	119.8	120.7	113.25	119.56	122.19	121	122	121	114	112
Gear ratio	4.23	4.32	4.22-1	4.15-1	4.08-1	3.88-1	3.6-1	3.57-1	3.62-1	....	....
Tires	33x4	33x4	34x4	34x3½	33x4½	34x4	35x4½	35x4½	35x4	34x4	34x4
Number cars	551	437	650	644	519	535	607	....	....	....	....
Number chassis	143	115	180	194	176	200	236	339	381	393	364
Number makes	122	98	125	138	108	119	133	156	193	270	239
Price	$2410	$2128	$1822	$1687	$1600	$2005	$2635	$2585	$2508	$2560	$2214

PERCENTAGE

Number of Cylinders

One cylinder	0	0	0	0	0	0	0	0	1	1	5
Two cylinders	0	0	0	0	0	5	1	1	1	2	3
Four cylinders	33.80	31.8	34.5	37	39.2	51.0	54	62	78	80	82
Five cylinders	0	0	0	0	0	0	0	1	1	0	0
Six cylinders	56.2	53.2	51.7	47	45.8	47.5	45	36	19	17	10
Eight cylinders	7.15	10.6	10.2	12	12.6	1.0	0	0	0	0	0
Twelve cylinders	2.85	4.4	3.6	4	2.4	0	0	0	0	0	0

Shape of Cylinders

T-cylinder type	6.12	10.48	6.8	5	13.7	16.5	30	31	30	22	20
L-cylinder shape	63.13	58.44	63.5	73	73.3	70.0	59	56	55	60	56
I-cylinder type	21.50	20.96	22.2	20	13.0	8.5	6	9	9	14	18
Knight type	3.04	4.2	4.0	2	3.6	3.0	3	3	2	1	0
Horizontal valve	0	0	2.3	....	....	....	....	....	....	....	...
F head	1.21	4.2	1.2	....	....	....	....	....	....	....	....
Two cycle	0	0	0	0	0	1.0	1	1	4	3	6

Cylinder Arrangement

Cylinders cast separate	2.3	....	....	1	4.8	4.0	6	15	22	28	39
Cylinders cast in p'rs	3.5	....	....	5	10.2	27.0	42	48	58	60	53
Cylinders cast in bl'k	88.4	....	....	87	78.4	67.5	39	29	18	12	8
Cylinders cast in 3s	5.8	....	....	7	6.6	10.5	13	8	2	0	0

Cooling

Air-cooled	2.3	1.95	0.5	....	.6	.5	2	4	5	6	7
Thermo-syphon	27.7	30.70	32.5	38	38.2	27	19	17	19	28	23
Pump circulating	64.8	67.35	67.0	62	61.2	72.5	79	79	76	66	70
Thermostat Control	5.2	....	....	....	....	....	....	....	....	....	....

Ignition Systems

Single Ignition	90.2	88.24	91.0	84	76.0	56	23	15	14	18	25
Dual Ignition	7.14	6.86	2.1	9	19.2	36	59	68	63	53	40
Two-spark ignition	0	0	1.1	1	1.2	1.45	4	2	0	0	0
Double ignition	2.66	2.94	3.5	3	1.8	4.55	11	15	23	29	35
Duplex Ignition	0	0	.6	1	1.8	2.0	3	0	0	0	0
Dual-double	0	1.96	1.7	2	....	....	....	....	....	....	....

Engine Lubrication

Splash oiling	0	0	.6	35	52.7	46.5	42	53	68	81	0
Splash pressure	67.4	69.61	71.6	35	23.35	16	39	32	20	0	0
Oil in fuel	0	0	0	0	....	0	1	1	2	3	6
Pressure oiling	32	29.41	26.7	30	23.35	37.5	18	14	10	19	10
Splash Gravity	0.6	.98	1.1	....	.6	0	0	0	0	0	0

Engine Starting

Electric starter	98.6	99	99	99	98.8	94.5	87	37	2	0	0
Acetylene starter	0	0	0	0	0	0	1	14	0	0	0
Air starter	0	0	0	0	0	0	4	9	2	1	1
Optional starter	0	0	0	0	0	1.5	2	5	0	0	0
Mehanical starter	0	0	0	0	0	.5	1	4	0	0	0
No starter as stock	1.4	1	1	1	1.2	3.5	5	31	98	99	99

Fuel Feed

Gravity	4.9	7.87	9.7	18	31.8	57	58	65	75	81	82
Gravity-pressure	0	0	0	1	2.4	.5	1	0	0	0	0
Pressure	5.6	5.89	6.8	7	12.0	22	41	35	25	19	18
Vacuum	89.5	86.24	83.5	74	53.8	20.5	0	0	0	0	0

Type of Clutch

Disk clutch	81.1	71.6	72.4	68	63.4	51	48	52	44	51	49
Cone Clutch	17.4	27.43	25.9	30	45.6	44	41	45	52	47	39
Expanding band	0	0	0	0	0	.5	3	1	3	2	6
Contracting band	0	0	0	0	0	4.5	5	2	1	1	3
None	0	0	.5	1	....	....	3	....	....	....	....
Electric	1.76	.97	1.2	1	1	0	0	0	0	0	0

Location of Gearset

Amidship, selective	10.03	12.98	17.4	13.5	20.5	31.5	39	45	54	66	74
Unit with axle, selective	4.15	4.08	7.1	9	14.0	18.2	15	20	20	17	14
Unit with engine, selective	83.5	79.92	71.0	77	63.1	49.3	42	34	25	16	9
Unit with torque tube, selective	2.34	1.02	2.0	0	....	....	....	....	....	....	....
None	0	....	....	....	....	....	3	....	....	....	....
Planetary	1.4	.98	.5	.5	.5	1.0	1	1	2	4	4
Magnetic	1.76	1.02	2.0	....	2	....	....	....	....	....	....

Wheels

Wire wheels—mountable	20.55	....	11.4	10	6.5	7.0	4	3	0	0	0
Wood wheels	63.70	....	72.2	79	82.5	88.5	96	96	100	100	100
Optional	14.39	....	16.4	11	11.0	4.5	0	0	0	0	0
Steel	1.37	....	....	....	....	....	....	....	....	....	....

Final Drive

Shaft and bevel	21.5	12.75	18.3	28	41.0	84.5	93	94	92	91	89
Chain	0	0	1.7	1.5	1.7	4.5	4	4	6	8	11
Shaft and worm	0	0	.5	.5	.5	1.5	1	1	1	0	0
Roller	0	0	0	0	0	0	1	1	1	1	0
Shaft and spiral—bevel	78.5	87.25	79.5	70	56.8	9.5	1	....	....	....	....

Type of Axle

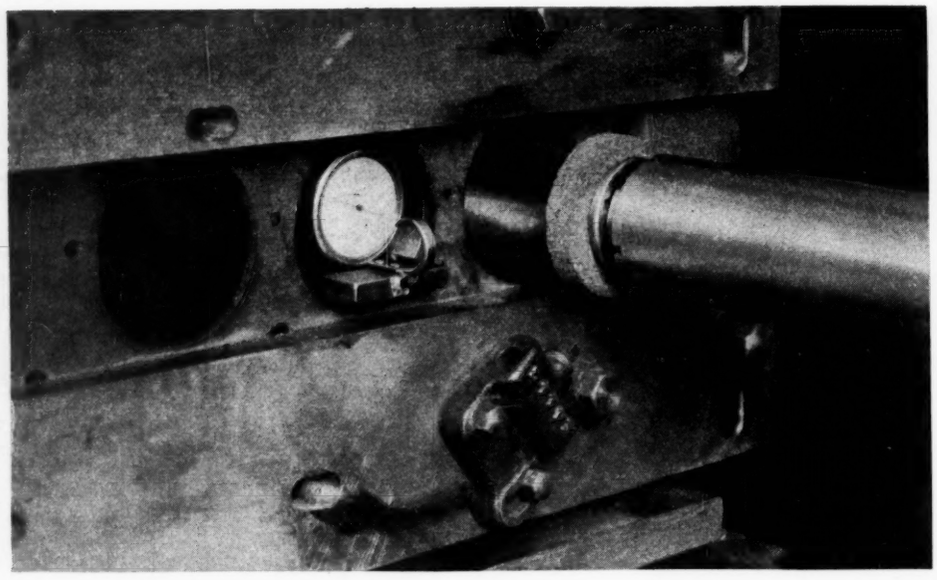
Floating	51.8	46.5	42.3	43.5	51.8	56.5	65	67	50	0	0
Semi-floating	26.85	24.2	26	25.5	23.6	23.0	17	26	49	0	0
Three-quarter floating	21.35	29.3	30.6	29.5	22.8	18.5	14	4	0	0	0
Dead rear axle	0	0	1.1	1.5	.6	2.0	3	3	1	0	0

Timing Gear Drive

Spur Gear	1.32	5.9	2.2	4	8.4	16.1	13	83	....	....	....
Helical or spiral gear	79.00	79.4	79.0	73	73.0	73.7	77	10	....	....	....
Silent chain	18.40	14.7	17.6	21	18.1	9.1	10	7	....	....	....
Worm	.64	0	0	1	.5	1.1	0	0	0	0	0
Spiral bevel	.64	0	1.2	1	0	0	0	0	0	0	0

Starter Voltage

Six	94.75	92.1	89.2	87.5	....	....	....	....	....	....	....
Twelve	5.25	6.91	9.7	11.5	....	....	....	....	....	....	....
Twenty-four	0	.99	.5	1	....	....	....	....	....	....	....
Sixty	0	0	.6	....	....	....	....	....	....	....	....



Type of machinery used to obtain greater accuracy

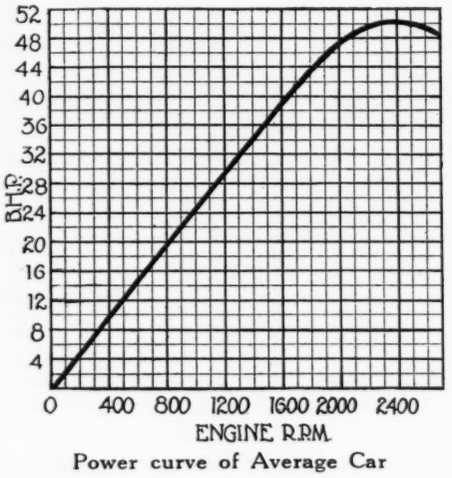
The engine is of the L-head type. Its six cylinders have a bore of 3.34 in. and a stroke of 4.92 in., giving a stroke bore ratio of 1.47 to 1. Last year's average car had a stroke bore ratio of 1.22 to 1, and this increase in ratio in this year's model has only one interpretation: Engine speeds are on the increase. Our average engine turns over 2,375 times per minute when delivering its maximum horsepower of 50.1.

The cylinder head is detachable. About fifteen 7/16 in. bolts hold the head to the engine block. Since the ignition is single, there are six spark plugs in the head, together with the priming cups. The wires leading to the spark plugs are not inclosed, but are held rigidly by a strap iron frame which is held in place by two of the studs that hold the removable head in place.

Iron Pistons Used

The engine block is common with the upper half of the crankcase and just whether this engine has a cast aluminum oil pan or a pressed steel oil pan is not definitely to be ascertained, but it is probable a pressed steel pan is used by the majority. The crankcase separates the engine on the crankshaft center line, and when the pan is dropped it is seen that three bearings are used on the crankshaft. These are plain and are adjusted by the removable shims between the bearing caps. The vertical center line of the bore passes through the crankshaft center, but the piston is slightly offset to compensate for the side thrust during the explosion stroke.

Iron pistons are used and these have three rings above the piston pin. The skirt of the piston is cut with oil scraping grooves to eliminate, or at least tend toward a reduction of the oil pumping difficulty. Hollow piston pins are used and these are fast to the piston boss and oscillate in the connecting rod bearings. The rods are not machined, but the weights of the reciprocating parts are balanced rather accurately, and it is



Power curve of Average Car

probable that each pair of reciprocating weights, that is, the weights of the pistons and the weights of the upper ends of the connecting rods in cylinders six and one, for example, will be the same to one-half of one ounce. Two bolt bearing caps are used on the crank end of the connecting rods, and four bolt bearing caps are used on the main bearings.

The camshaft has three bearings. These are tubular bearings and the way to get at them is to pull the rod out from the front of the engine. This can be done very easily, for the bearings are of three different sizes, the largest at the front, and the smallest at the rear. Somewhere at the rear of the camshaft an eccentric is placed, the purpose of which is to drive the oil pump. Spiral gear drive is employed for the camshaft. It is interesting to note that this type of camshaft drive is sixty-one per cent in the majority.

Lubrication is force splash. A plunger pump driven from an eccentric on the camshaft, mentioned above, forces oil to each of the three main bearings. Oil grooves in the bearings distribute the oil and conduct it away from the bear- and collects in the splash troughs beneath the connecting rods. It is picked up here by the spoons on the end of the rods and splashed to all parts of the engine. This includes the cylinder walls, the cams and the camshaft bearings. These latter are grooved and carry the oil through the bearings. The overflow from the bearings, the splash and the troughs is conducted to the lower sump by the overflow passages in the trough pan. The oil mist also serves to lubricate the tappets and breathers are provided to the channel for the tappet, spring and valve stem lubrication.

The power curve for the engine is shown herewith, and it is seen that 50.1 hp. is developed at a crankshaft speed of 2375 r.p.m. The exact nature of the torque development for this average engine is not known, but it is probable that a torque not over 135 to 140 lb. ft. is developed.

A centrifugal water pump is driven on the auxiliary drive shaft along one side of the engine. From this same shaft the generator and ignition distributer are also driven. On the other side of the engine, the carbureter is located. It is bolted directly to the engine block. A side outlet carbureter is used, and the gases from it are led through the passage between the third and fourth cylinder to a cast-in intake manifold, that has one of its walls in common with the exhaust passage.

Vacuum Tank Fuel Feed

The practice of using a side outlet carbureter while representative of the average for this year will probably not be average for next year; for already, a distinct departure in design has been made in many engines but has not as yet affected the average. It seems reasonable to expect the top outlet carbureter to gain in prominence, because the possibilities toward fuel condensation are too great with the tortuous passages in the manifold, necessitated by the side outlet carbureter. A vacuum tank fuel feed system is used as this type is 73.9 per cent in the majority.

So much for the engine. The clutch is of the dry disk type. It is in unit with the transmission, and this is of the threespeed and reverse type. Ball bearings are used in the transmission, on both the countershaft and the main shaft. Speedometer drive is not yet taken from the transmission, but it is probable that within a year or two this will be average practice. A tubular propeller shaft is used. No driving strains are taken by this shaft for the Hotchkiss principle is employed. A floating rear axle is used. The ratio of the gears is 4.23 to 1. All springs aer semi-elliptic, and they rest on the axle pads.

The electric system on our Average Car is of three unit type. A six-volt starting motor engages with the teeth on the flywheel, through the Bendix drive. The generator is gear driven, being fitted to an S. A. E. flange on the engine, which is driven from the camshaft gear. Regulation of the electrical output is by means of the third brush. The battery is of 100 ampere hour capa-

city. Ignition is by a single breaker point system. Headlights are of the two bulb type. A tail light and a dash light comprise the balance of the lighting system. Wiring is of the grounded type. Insulation is furnished by means of metallic flexible conduit.

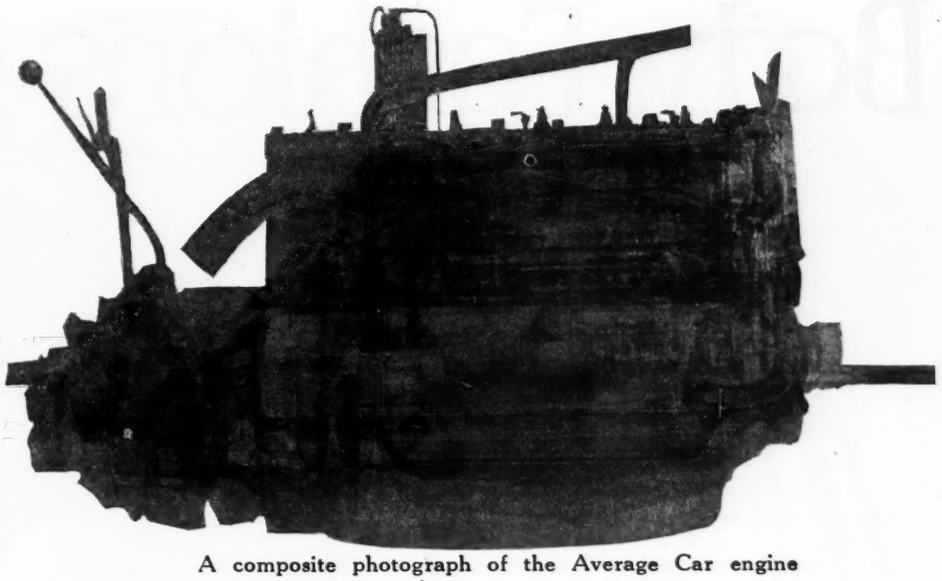
Wood wheels are standard equipment on this Average Car. Roller bearings are used in the wheel hubs.

Concluding our confinement of attention to chassis details and taking up the body construction we find that except for one or two changes the body on the Average Car of 1920 is the same as for 1919. The changes are notably confined to style and detail. Abandonment of the sharp beveled edge body is one of the steps that contrast this car from last year's. The attainment of individuality in this year's cars is obtained by adherence to the radiator design. By that I mean, a car with sharp corners to its radiator is very apt to have the same characteristics in the general lines and contours of its body. A rounded radiator generally carries its lines to the body where they are blended in pleasing harmony. One feature of the Average Car that is not discernible, until one sits in its seats, is that body room and seating comfort is improved over last year's offerings. The reason is that in most makes it has been found possible to shorten up the required space under the bonnet by better engine design, and adding these additional inches of space in places where they mean so much more to the occupants.

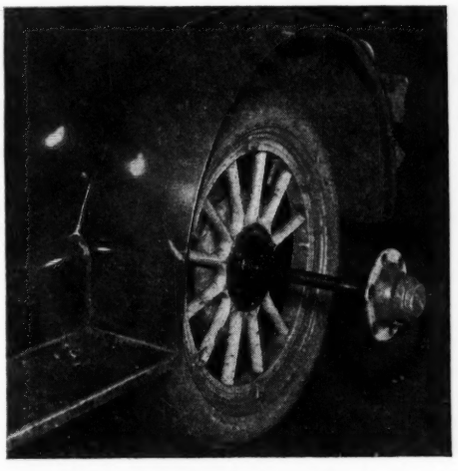
Imitation Leather Used

Upholstering in this Average Car is probably not of leather. Rather than use a split leather, it is much more appropriate to use a good grade of synthetic material. The wearing qualities are very good, and climatic conditions, heat, cold, rain, and shine do effect any change in it or on it.

Accessibility, which should be a feature of every car, is a factor that notably affects our Average Car by its absence, and the writer has found from a survey from the service man's angle of looking at our cars, that there are too many parts, small in cost, that require the expenditure of a goodly amount of money to replace, simply because the parts are in a place where in order to get at them, it is necessary to first get at a few other parts. One case in particular is brought to mind, and there are not many like this, where in order to remove the engine from the chassis one must first remove the body bolts, and disconnect the clutch, brake and the other pedals, and then slide the body back about 6 in. Then the engine must be jacked up from underneath while the front hangars are loosened, and while still on the support, a chain hoist is made fast, and the engine slid back about 5 in. when it will clear the front engine supporting cross member of the frame. At this point I might ask a few questions that have a pertinent bearing on the subject of accessibility.



A composite photograph of the Average Car engine



Full-floating axle used in Average Car

Why should it be necessary to remove the distributor, and thus destroy the ignition timing which the manufacturer determines as the best, by the removal of the generator? Why should an oil filler spout be so located that any oil, inadvertently spilled, be liable to splash on the generator or the starting motor? Why should the electric wiring be placed in such a position that when the dust pan under the engine is dropped and then replaced, that the wires are subject to cutting by the edges of the pan, unless the pan is placed just so, within a 1-16 in. Why should a grease cup be placed so that in order to get at it one must circumnavigate an exceedingly hot muffler, or exhaust pipe? These questions have all arisen because of personal experiences of the writer on a great many different makes of cars of 1919 design. Attention to detail from the service angle when designing will make it impossible to ask questions of this nature.

A word in regard to the manufacturing methods of this Average Car. A tour of the factories impresses one with the fact that accuracy of machining is a great deal more common now than has ever been the case before in quantity production. Companies whose governmental assistance during the times of stress, installed elaborate inspection methods, and exacted close limit work, for the military knows only one code of standard: The blueprint specification. Machine jobs where the specifications demanded a tolerance of plus or minus 0.0005 in. were not accepted unless they measured so. The men doing the work grew to be familiar with close exactness, and the result is that in many factories these elaborate and rigid inspection methods are still in force.

TENDENCY OF CAR DESIGN

(*Continued from page* 18)

man in the repair business to greatly reduce his stock of parts and consequently reduce the invested capital necessary for him to do business as a service man on Briscoe cars.

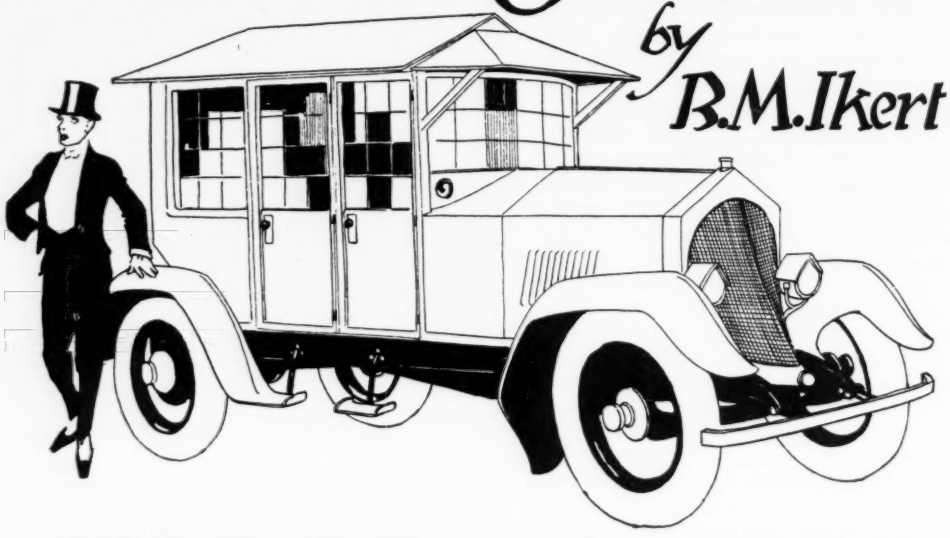
The number of drill sizes, taps, stampings and material specifications have been remarkably reduced. For example, only one design of spring shackle is used. All spring bolts are of identical dimensions, and because the drive is taken through the springs, the load on the bolts at the front end of the rear springs is the greatest and determines the dimensions of all bolts. Rights and lefts have been eliminated to an unusual degree. The use of identical parts for both sides of the car is advantageous in purchasing; it greatly reduces tool cost and at the same time enables the dealer to carry a complete stock of parts with much less investment. Another notable example of saving on material and tools is found in the spring horns and spring brackets, which are alike on both sides of the car.

What applies to the drill sizes also applies to the reamers, which have been cut down to an unusually small number, and practically all of these are standard sizes. The same limits are used wherever possible, the drawings generally specifying plus 0.0005 in. and minus 0.0015 in. tolerances.

Body Fashions of 1920

by B. M. Ikert





Outwardly Bodies Have Not Changed Much—Bevel Edge Popular on Sport Models—Aluminum Steps in Place of Running Boards Gaining Favor—Upholstery Improved

THE modern motor car body has reached that stage of development where drastic changes in designing are not likely, for a time at least. We do not expect to find anything unusual in the looks of cars, collectively speaking, because to do so would mean a more or less freakish design and public demand dictates that this shall not be the case. The present type of motor car body is filling to large a public want to warrant any great change. A decade or more ago when motor cars were in a state of real development it was not uncommon to see entirely new body ideas at the shows from year to year, but bodies of today do not differ basically from those of 5 or 6 years ago.

While this year's shows generally were looked upon to introduce the so-called post-war models, by which we mean cars with fuselage type bodies, airplane engines, etc., this was not the case, excepting in a few instances where entirely new models of makers who previously have made cars were shown. But even these cars followed conventional practice for the most part.

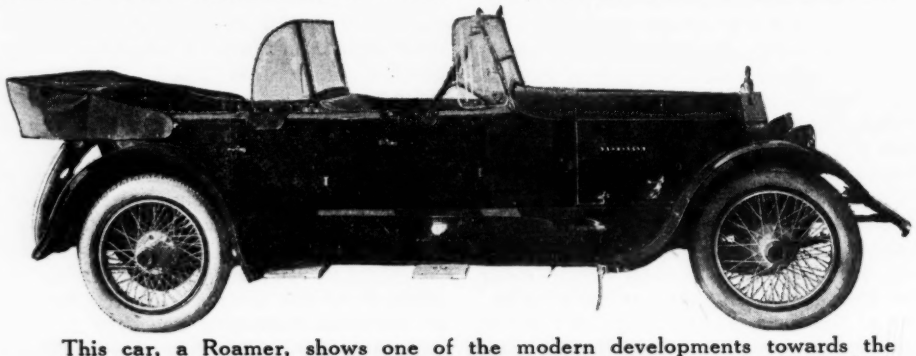
Two things are in evident on this year's cars. More attention has been paid towards getting greater comfort and convenience. The bodies are roomier and the extra room has been secured with a given wheelbase. It has been done by shortening up powerplants, which in one instance, on the new Marmon, has reduced the hood length 3 in. This has been utilized in the tonneau and driving compartment. There has been a tendency to place the engine closer to the radiator, thus adding to the tonneau and driving compartment. In this way a better balance has been obtained in the body, where formerly we saw a long tonneau with the driving compartment closely coupled to the dash.

Bevel-edge Body on the Wane

The bevel-edge body which made its appearance a few years ago is still popular on the sport models, although indications are that it is losing out on the more conservative models. If the bevel edge is losing out it at least did one thing. It resulted in better workmanship on doors. The reason is this. When the bevel edge body first came out there were many instances where the bevels on the doors did not line up with the bevels on the body panels or shroud. The fault was in the door hinges and the makers of automobile body hardware took the clew and brought out some really substantial forms of door hinges and latches. Ordinarily the rounded or roll-edge body would not have revealed this condition because curved surfaces can be made to line up better. Better body hardware thus has done away with much of the former rattling of doors.

Running-boards Eliminated

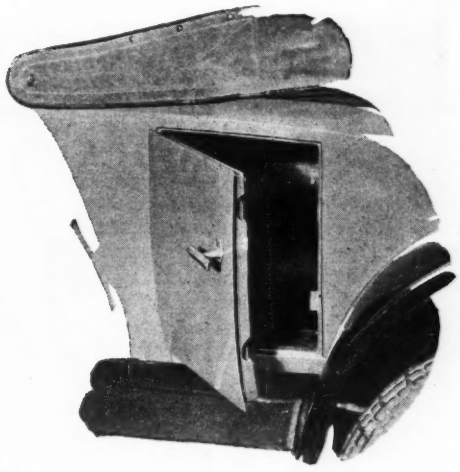
Very often ideas that are first used on sport models later find their application on regular production jobs, and there is evidence of this on some of the cars this year. For instance, it has been customary on many sport cars to dispense with running boards, fitting in their place aluminum steps. This type of construction is now being used by several makers and one of the notable examples is found in the new H. C. S., designed by Harry Stutz. On the new National the orthodox



This car, a Roamer, shows one of the modern developments towards the elimination of running boards and the adoption of a tonneau windshield as standard equipment



Most of the speedster models of roadsters use no doors. Here is shown the aluminum steps and protecting pad on the Templar body



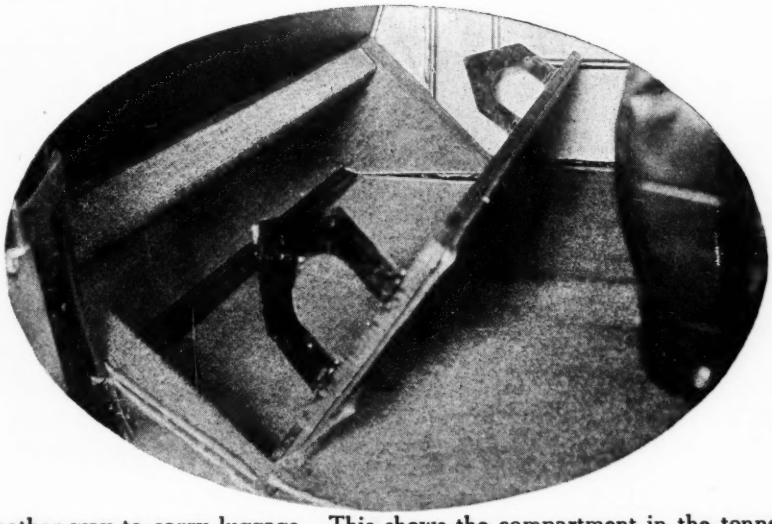
The question of carrying baggage properly has been given much thought. The Auburn roadster has a spacious compartment to which access is had through this large door on the side of the body

method of fitting running boards and fenders has been departed from to slight extent in that the front fenders have not been joined to the running boards. The latter have been shortened some 10 or 12 in., thus leaving a gap between them and the fenders. Whether or not this is a step towards the elimination of running boards remains to be seen.

Luggage Provided For

Heretofore the running boards of a car were deemed essential for the carrying of luggage, spare tires, battery, etc., in addition to performing their other functions. But this has been changed because car designers have realized that the betterment of roads throughout the country means cars will be used more and more for extended trips, bringing up the question of carrying baggage, etc. The running boards have been looked to to provide space for this, but it is hard to keep luggage clean on them. In the cars this year we find much attention has been given towards the utilization of space in the body for carrying luggage, etc., and some makers are furnishing trunk racks on their cars as regular equipment. In some instances a compartment has been secured in the tonneau just back of the front seat by the addition of a sloping footboard. With the storage battery placed under the front seat, and spare tires or wheels hung on the rear or on a bracket attached to the side member of the frame, it readily will be seen why running boards have been eliminated on some cars. This fact coupled with the adoption of spacious carrying compartments in the body means a clean cut design that is not marred during the touring season by the necessity of having to strap a lot of fitments to the running boards.

It looks as though the slanting windshield is here to stay for some time, being used on the majority of cars. On the closed models, however, the vertical windshield is used to a great extent, which is also true on some of the sport models, like the new Jackson. The slanting windshield has the advantage of shortening up the top several inches and reducing to a slight extent the wind resistance. One of the objections raised against the slanting windshield is that it cannot be made as water-tight as the vertical shield. There has been adopted a better method of windshield mounting and rattling windshields are not nearly so common as in former years. An excellent feature noted on many of the 1920 models is a windshield cleaner. Some of the new sedans and coupes are equipped with a sun shade or visor, which when not in use rolls up out of the way under the top. The shade is made of leather.



Another way to carry luggage. This shows the compartment in the tonneau of the new Marmon

Better Upholstering

In the last few years there has been a vast improvement in spring suspension on cars and this has called for refinement in upholstery and a more careful tailoring of the interior of cars generally. With poor spring suspension the item of upholstery is not so great because the benefits of deep cushions, etc., are lost in the jostling around of the car. But with good suspension any slight defect in the upholstering instantly is felt. Consequently on the cars this year very deep cushions and seat backs are in evidence, the job being done in French pleats almost invariably. Medium priced cars are using fabrics made by the large chemical houses for upholstery work in place of split leather, because experience shows that this fabric will outwear the cheaper grades of leather, besides being easily cleaned.



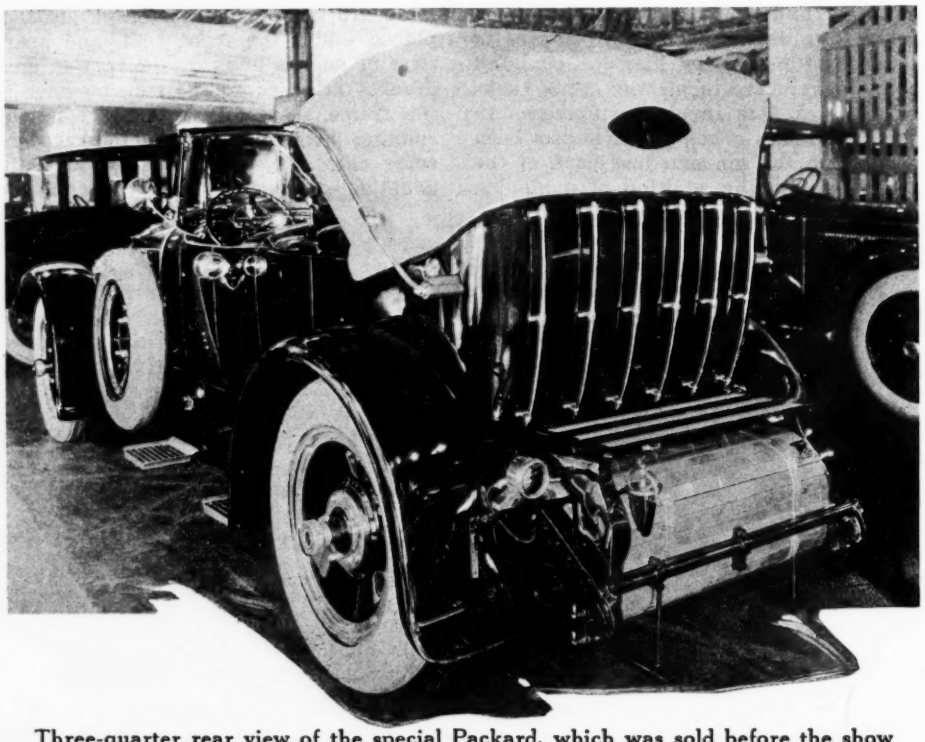
New Passenger Cars at Chicago

WITH the exception of one or two entirely new cars there was the same line of cars arrayed at the Chicago as that of the New York show. Anyone who saw the show of a year ago will admit that there is lacking in this year's show the bright color body jobs that featured the dealers' show in 1919. As a general thing the colors on the cars this year run into somber colors, dark blue, maroon and black being chosen by most of the makers. Sport models of which there are quite a few are painted in the brighter colors, yellow or cream being quite a favorite. Some special jobs like the Roamer shown in the Armory are built with a polished aluminum body, which with red fenders and wire wheels makes a striking car. This is made all the more so by using a nickel-plated windshield, instrument board and all other fittings. The entire body from radiator to tail light is polished metal.

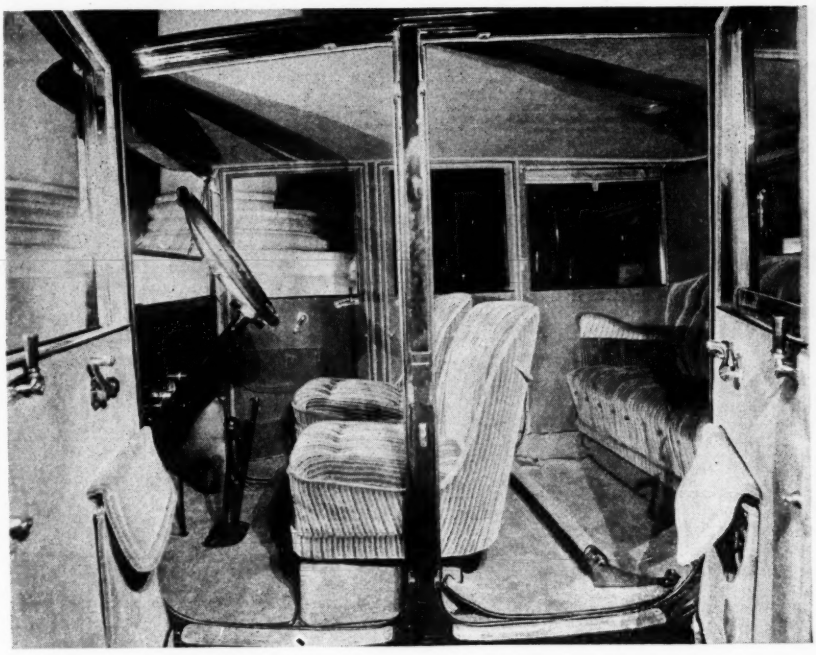
California Top Popular

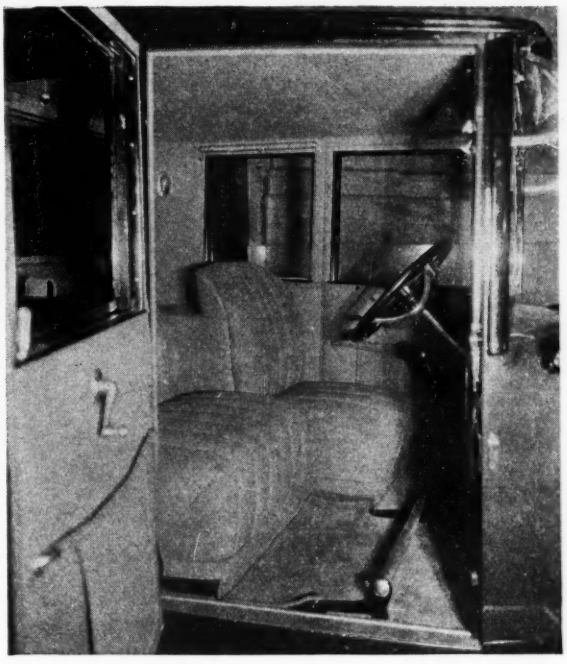
Nearly every maker represented at the show is showing some sort of closed model, the sedan being the favorite. Some of the cars, like the new Leach Biltwell, a California product, and a special model of the Cole are showing a California top, which is a permanent structure and perhaps the forerunner of what we may expect to see in the next few years on the majority of our cars. There seems little room for doubt that the future car will be an all-year top proposition, in which it will be possible in less than a minute to have a closed car by merely pulling four windows into place. As it is done now on the Leach-Biltwell, the process merely consists of sliding the middle sections of the top sides into place and pulling down the front curtain, which when not in use cleverly are hidden into the interior of the top. The middle windows when not used are pushed into the permanent part of the top at the rear. Altogether it is possible to change from an open to a closed car in about 10 seconds.

The Leach Biltwell, which made its debut at the show, is a 126 in. wheelbase job with a distinctive type of body. Two types of bodies are shown, a seven-passenger sport, and four-passenger speedster. There are many innovations on the car such as electric lights to illuminate the steps, signalling device, optional colors, etc. The car has a model 9-N Continental engine with 3½-in bore



Three-quarter rear view of the special Packard, which was sold before the show opened for $10,000. It is finished in maroon, with nickel-plated trimmings





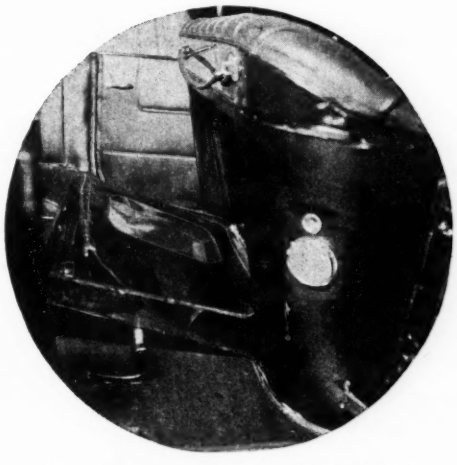
Upholstery and interior appointments on the cars have been improved as well as the other things that go to make up the modern car. Here are shown interior views of the Dodge B rothers and Cadillac closed models

and 5½ in. stroke. The cooling system on this car was designed particularly to assure good cooling in desert and mountain use. Other features of the car include a Brown-Lipe gearset, Timken axles, Delco starting and lighting, cord tires, 32 by 4½ in. Disk wheels can be had if desired and a spare is carried on the left side of the car.

New Maibohm Shown

A new model of the Maibohm was shown in the Annex and received much favorable comment. Several changes have been made in this car, particularly in the body design which instead of the bevel edge uses a flat edge with a sloping windshield similar to the type used on the Jordan. The seats have been placed at a comfortable angle and upholstery is in brown leather. Another improvement is in the doors. The rear doors now being square cornered instead of the semi-triangular shape. Chassis changes include the substitution of a larger clutch, and adoption of the Tillotson carbureter. The former starting and lighting system has been replaced by Bijur and the Muncie transmission takes the place of the older type.

The new model of the Dixie-Flyer was shown in the Armory and while the job was not different essentially from the former models, there are certain refinements. The running boards have been lowered 3 in. and are 8 in. longer than before. In addition the fenders have been made slightly wider and brought down over the wheels further. A 15 gal. square gasoline tank replaces the former 10-gal. cylindrical tank on the rear which has the effect of making the body appear lower because of the square tank filling the space between the rear frame much better.

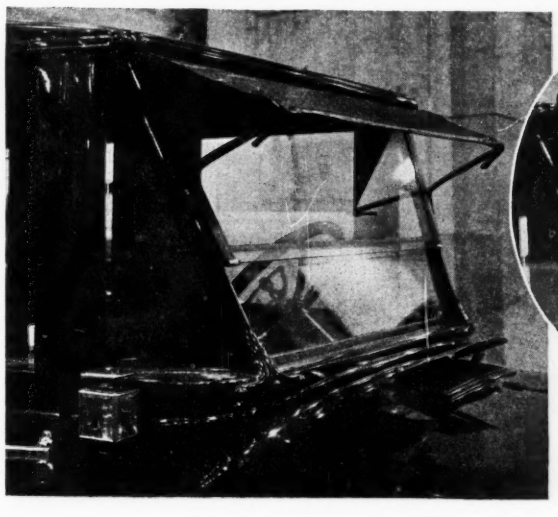


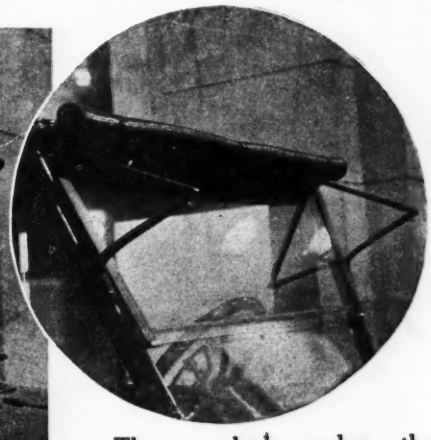
A novelty on the Scripps-Booth. The method of carrying the side curtains in a metal lined compartment

The engine size has been decreased from 3½ by 5 to 3¼ by 5 in. An Eisemann magneto replaces the former battery ignition.

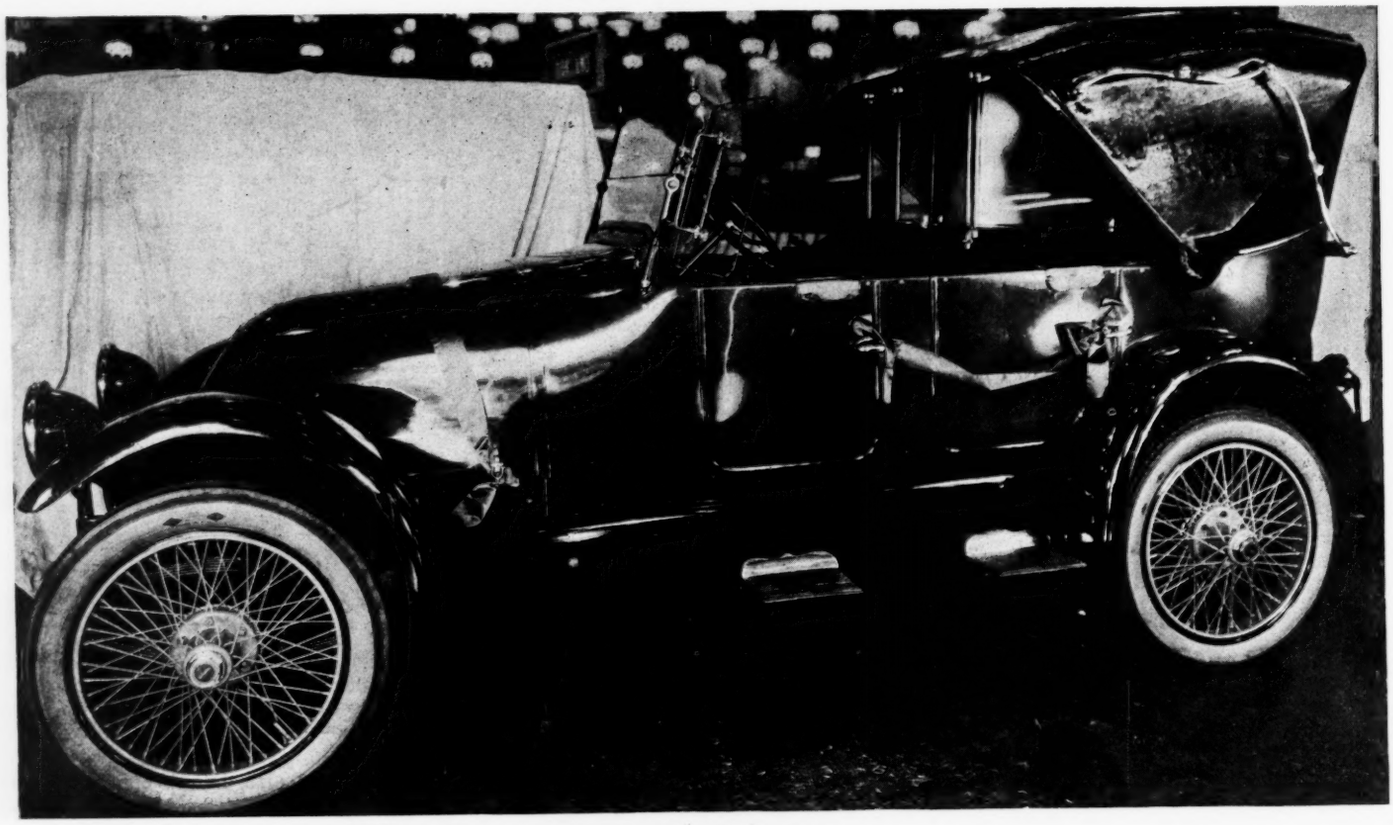
Cadillac Changes Size

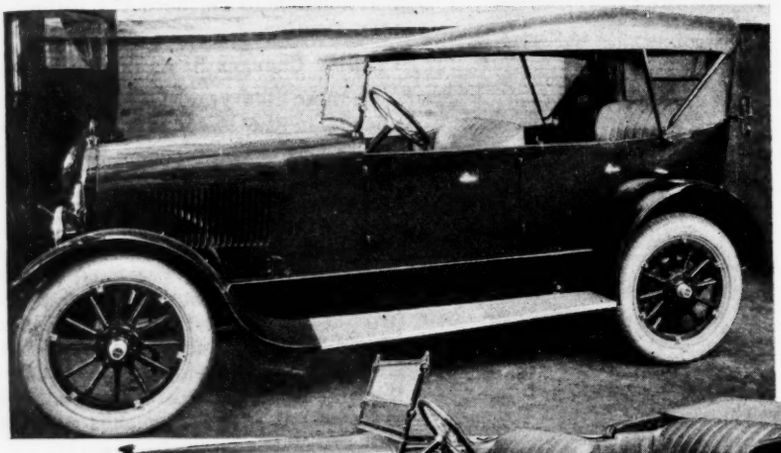
Cadillac this year has made a definite change in the size of its car. All cars which use bodies of more than five-passenger capacity are mounted on a 132 in. wheelbase. Cars of five-passenger capacity and under, as on coupes and small sedans are now mounted on 125 in. wheelbase chassis. There is no difference in the essential constructional features of the two models, except that of wheelbase. The engine and the other component parts being identical, description is facilitated. A new manifolding system is used which makes use of the hot exhaust gases. The carbureter is still located between the V of the cylinder blocks, but the manifold from the carbureter to the blocks is much larger in size, because extra space is provided

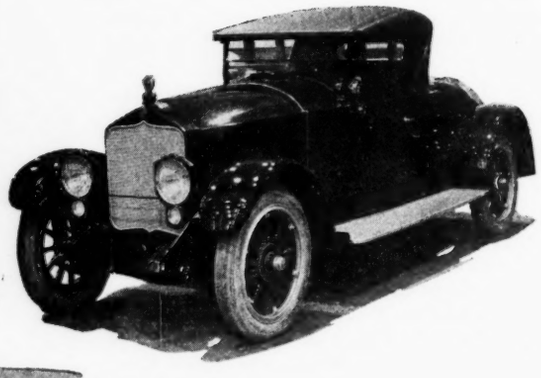


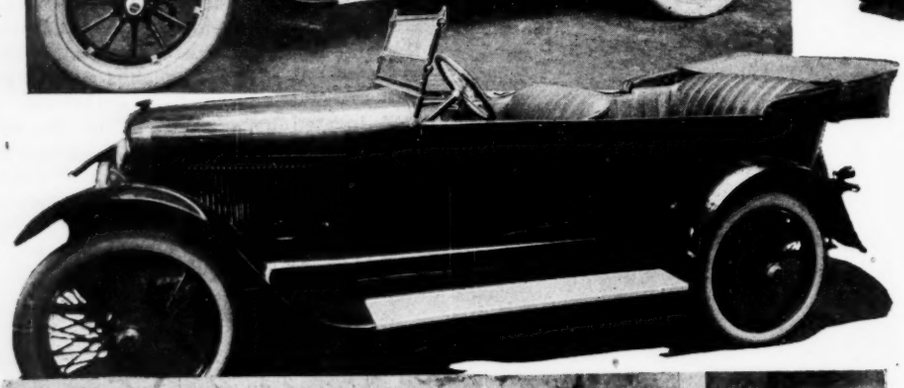


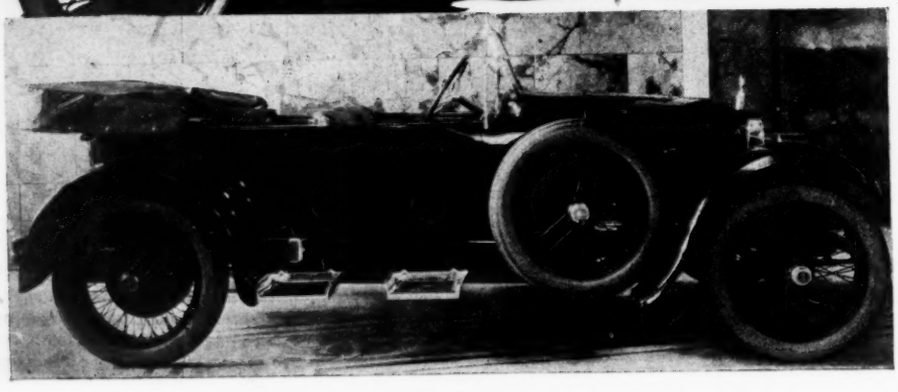
The sun shade used on the Hudson closed car, showing it in use and rolled out of the way. It is made of leather











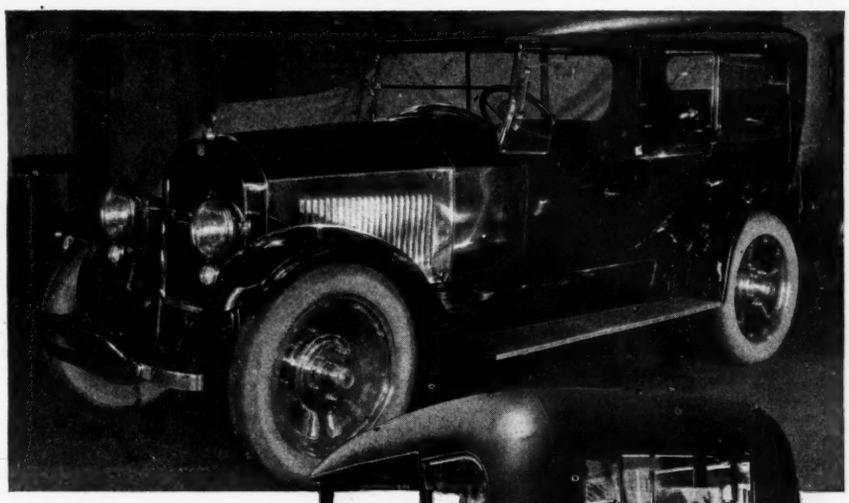
Above is shown a nobby looking Franklin on which the running boards have been eliminated and steps substituted. The car has a Victoria top and tonneau windshield. Below it to the left is the Sayers Six, shown for the first time this year, the Maibohm, which has a new body and chassis refinements, and the new H. C. S. car, shown at the Auditorium. The National Sextette shown immediately above is typical of modern trend towards high body sides, with low running board splashers

in the hollow casting for the hot gases A slight change has been made in the electric system of the Cadillac, which makes for greater simplicity especially since it effects the servicing end of the electrical system. The motor generator is made more compact and the parts can now be adjusted or oiled very easily.

One of the interesting things discovered at the show is the body construction used on the Lexington sport model. Heretofore it has always been considered necessary to separate the bottom of the door from the top of the splash apron, if one is used, and from the top of the frame if a splash apron is not used, by the width of a frame sill. Lexington departs from this practice by bringing the bottom of the door into line with the top of the frame. This produces a very pleasing appearance and also removes the possibility of marring that part of the body surface that is exposed directly beneath the door, which is so very easily scratched when entering the car.

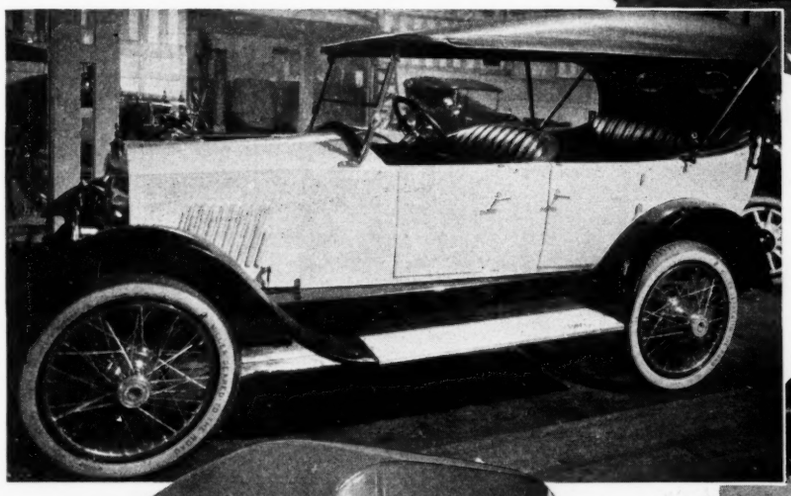
Packard Shows $10,000 Car

Packard has perhaps the most interesting exhibit at the show. A $10,000 masterpiece of coachwork, representing all that the master minds of body building have been able to assemble into one car. This car is distinctly Packard, having the characteristic Packard radiator, differing from the usual only in that it

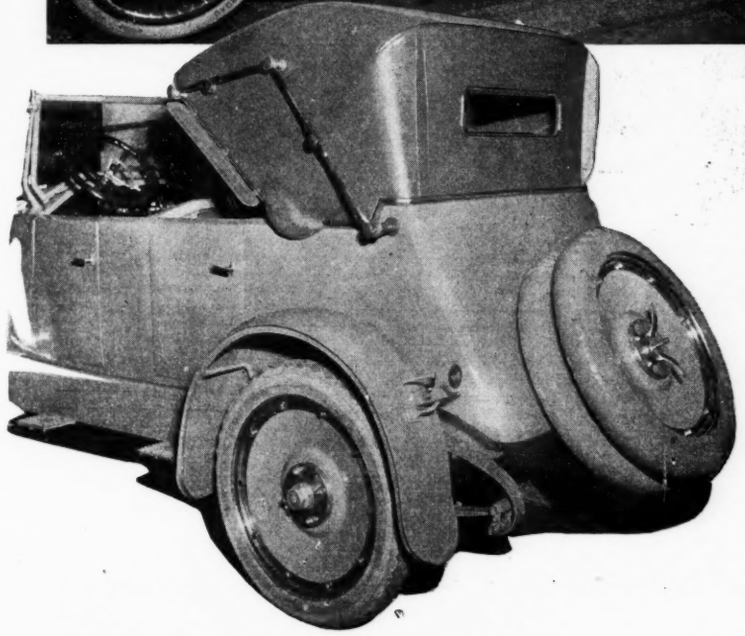


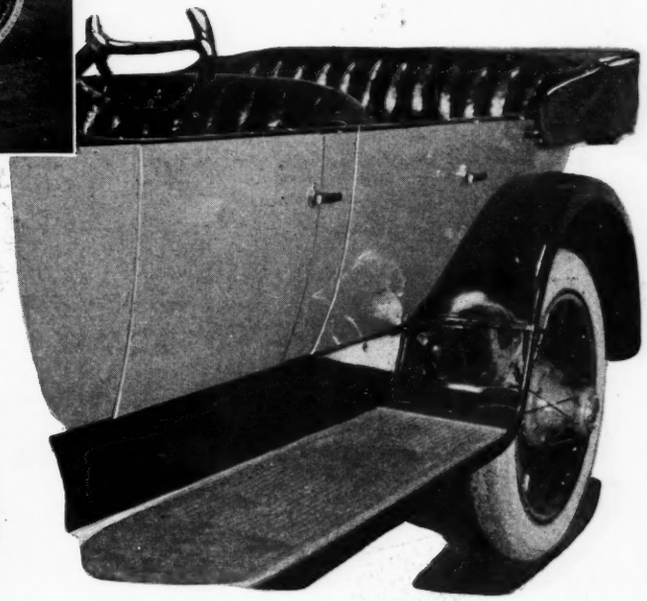


Above is shown the special Cole model with aluminum wheels and California top



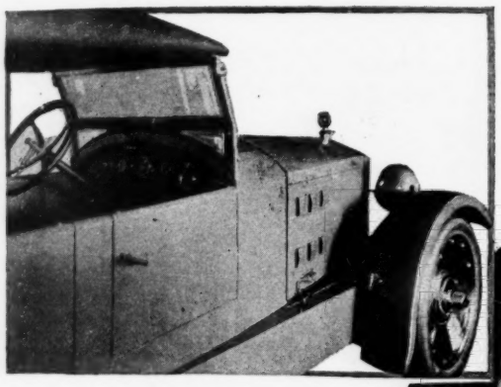
This is the Leach-Biltwell, a California built car that is replete with refinements and equipment. The car is noted for its excellent body work. To the left is the new Allen, which has made several changes in engine and body

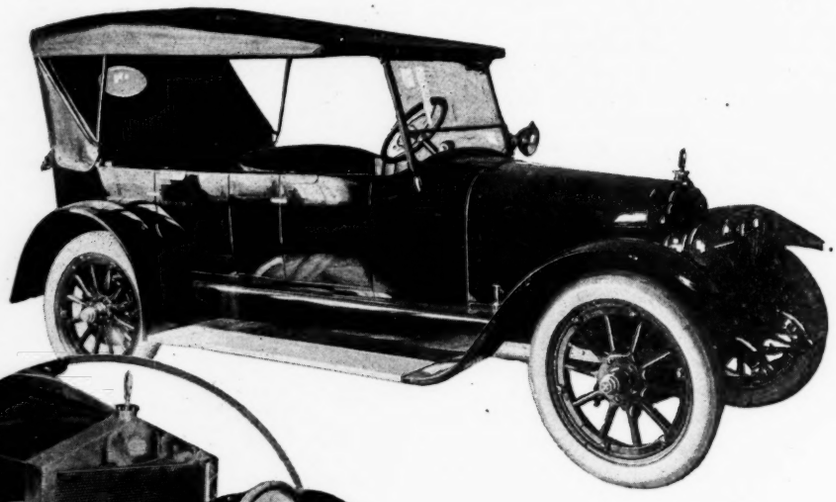




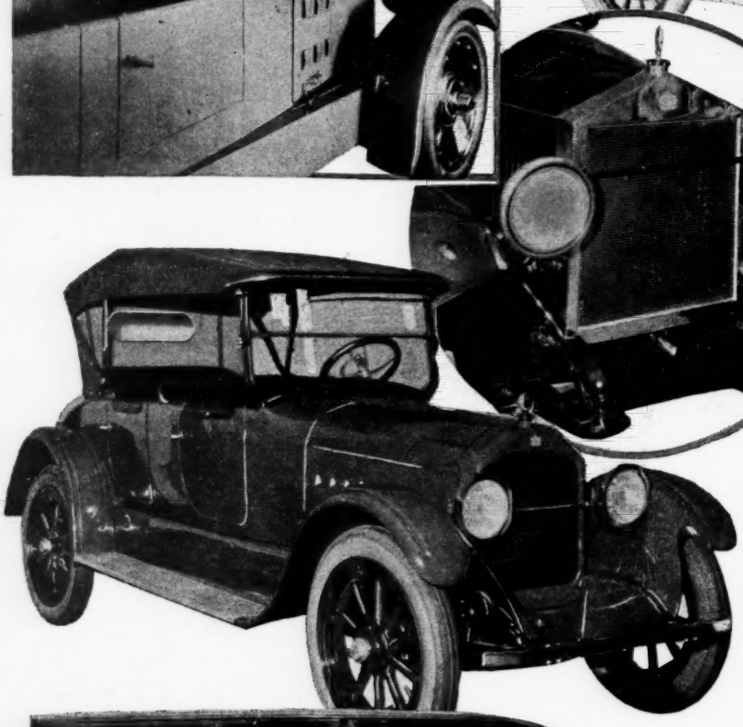
Left, Velie sport model, a cream colored job that has a brown leather top to match. Above is the Lexington body which has a rather novel door layout in that the bottom of the door is on a line with the frame

Below is a partial view of the new Jackson sport car, showing the novel windshield construction



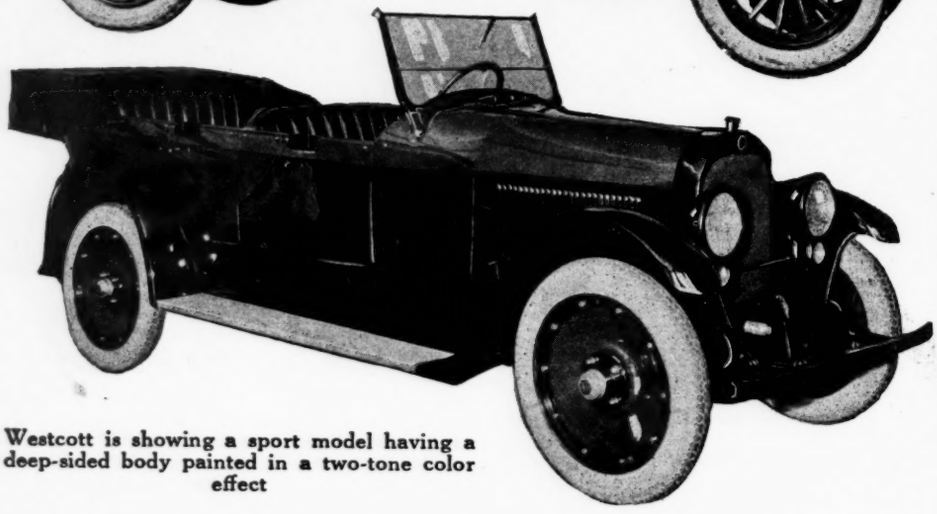


This is the latest model of the Templar, noted for its clean body design



Above is the Moon radiator, a type being quite popular on many cars. Below it is the new Peerless four-passenger sport car and the latest offering of Winton sedan.





Westcott is showing a sport model having a deep-sided body painted in a two-tone color effect

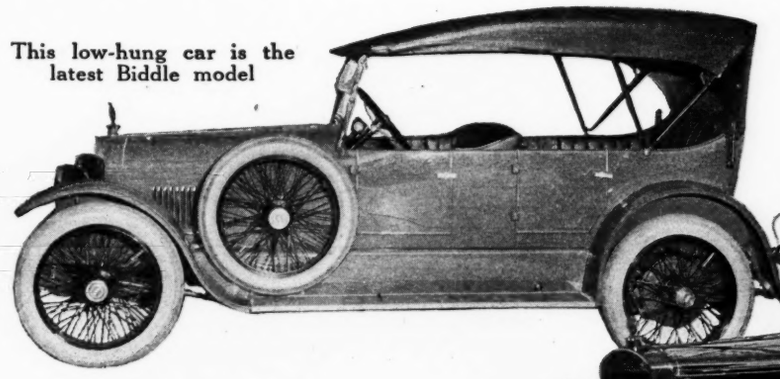
is nickelplated. A victoria top together with a tonneau shield that is directly in front of the top and that is shrouded by a cowl effect which leads from the rear of the front seat to the windshield lends appearance that departs from the usual tonneau windshield construction. The rear of the car has provision for a trunk for touring purposes, which is kept from making contact with the rear of the body by a series of nickleplated rods. The gasoline tank which is set out from the body so that the trunk can be placed over it, it covered with shrouding of maple strips finished in the plain.

The chassis of this car is standard Packard material.

The Maibohm is shown in a new model with refinements in many details but with no radical changes in design. A constant evolution in both design and workmanship has gone forward, despite the fact that the Maibohm factory was burned down a year ago and has moved twice since then, the last move being into a big new plant at Sandusky, O., which provides a daily capacity of fifty cars, including bodies.

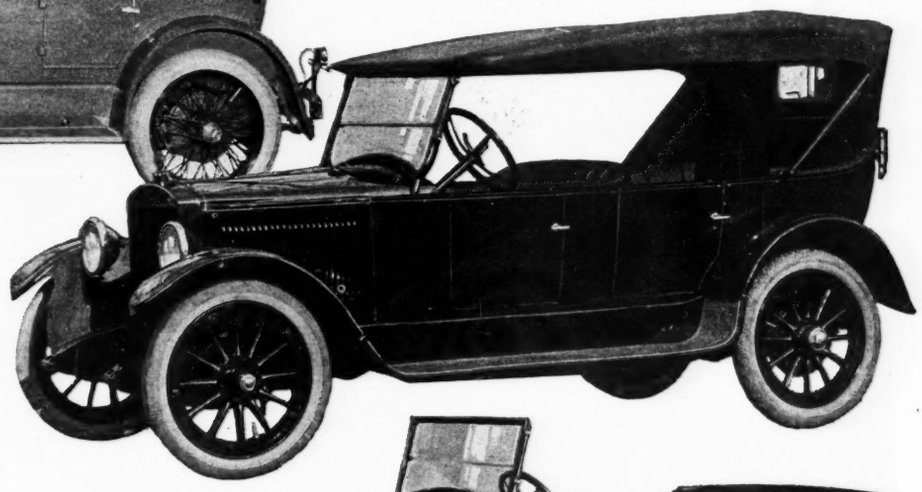
The size of the frame section has been increased 100 per cent to 7 in.; the semi-elliptic rear springs are now 53 in. long and 2¼ in. wide, and of Perfection make; the size of the Willard battery has gone up to 94 ampere capacity, Timken bearings have been installed in all wheels, the Borg & Beck clutch has been increased to the 10-in. size; the starting motor and generator have been changed to the Bijur make with S. A. E. flange mounting of both, the new S. A. E. installation is used on the Atwater-Kent distributer; flexible disk universal joints have been adopted after a year of successful test; the radiator has been increased in size, the valve-in-head engine has been increased in efficiency, a smart and efficient double-concealed-hinge hood is used, and a number of other minor detail improvements have been made.

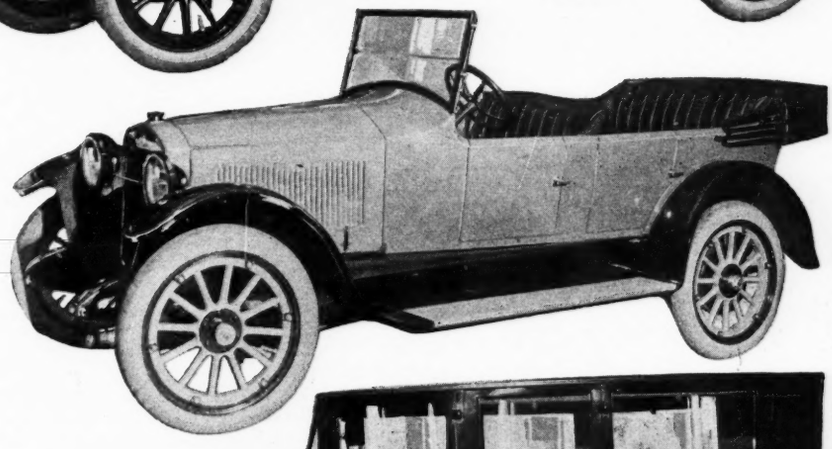
Two characteristic body types are now being produced at the body plant which

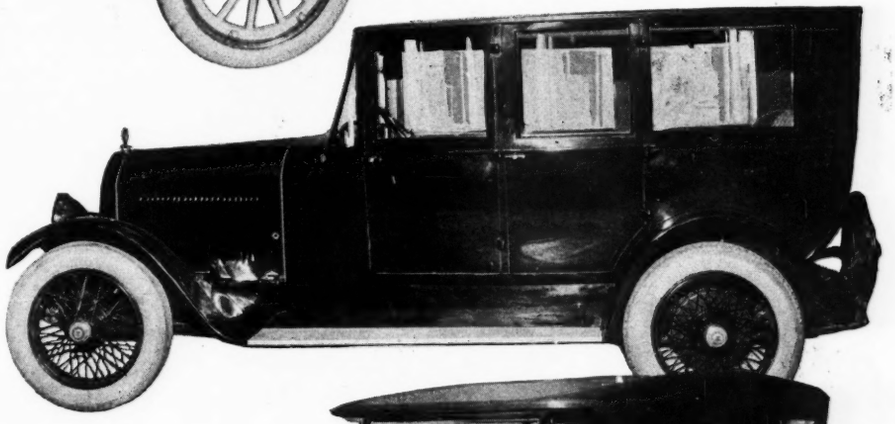


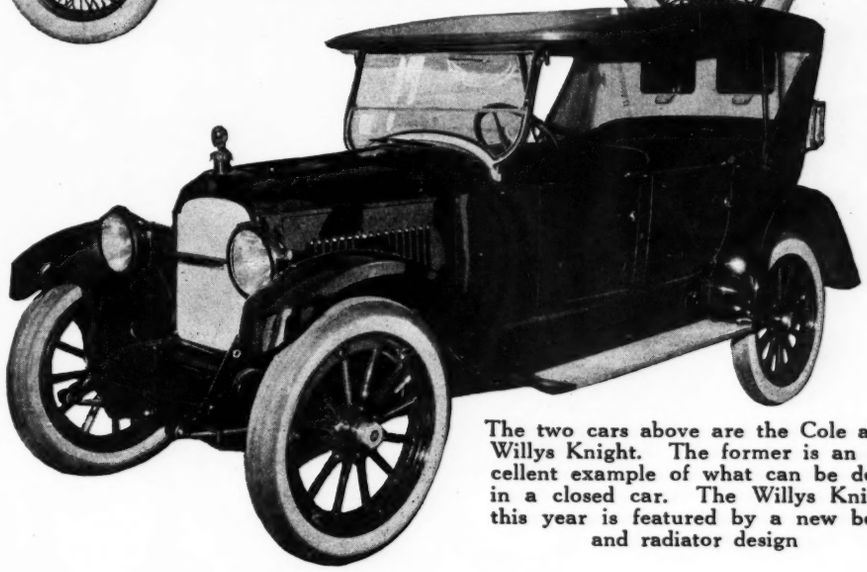
This low-hung car is the latest Biddle model

Below is shown the new Saxon car, which is radically different from anything this concern has turned out. Below it is the Liberty five-passenger, a car noted for its neat body designs and accessible chassis









The two cars above are the Cole and Willys Knight. The former is an excellent example of what can be done in a closed car. The Willys Knight this year is featured by a new body and radiator design

is an integral part of the new Maibohm factory, and additional body styles, open and enclosed, are promised for the months soon to come. The present line consists of a standard 5-passenger phaeton, at $1,395, and a smart four-door 5-passenger sedan at $2,100.

Light weight characterizes the new line, the phaeton is shipped at only 2,350 lb.

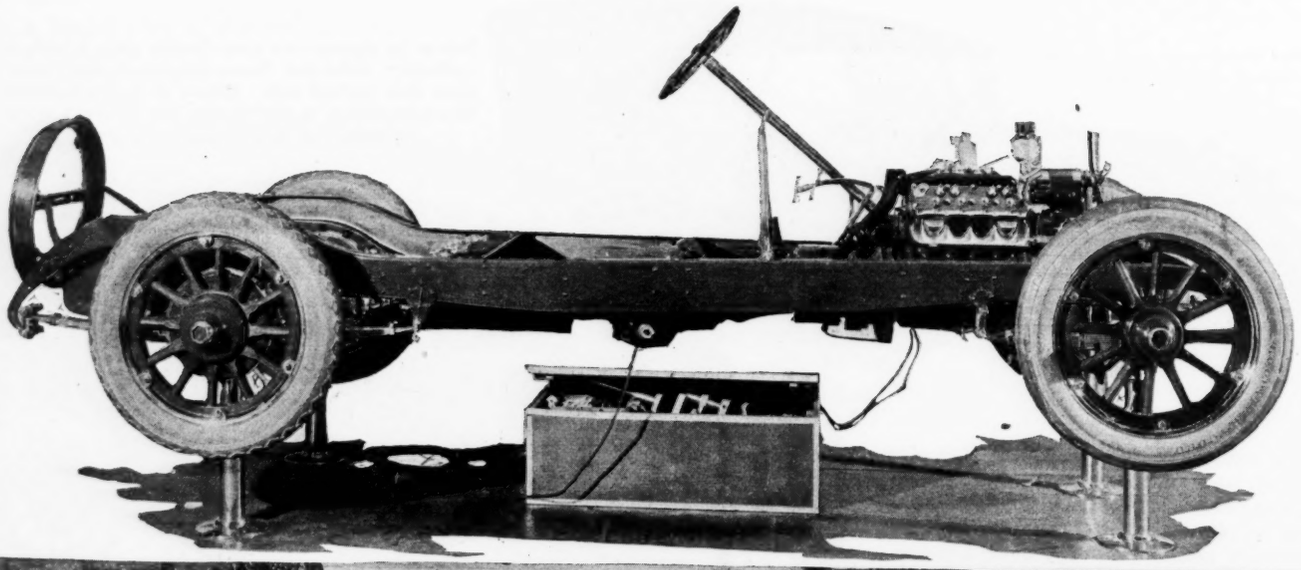
The engine is a six-cylinder Falls, which features all the advanced engineering principles of modern aircraft design. The bore is 3⅛ in., the stroke 4¼ in., displacement 195.6 cu. in., horsepower rating 23.44, and the engine develops 46 hp. at 2,290 r.p.m. Its maximum speed is 3990 r.p.m., and it weighs 425 lbs.

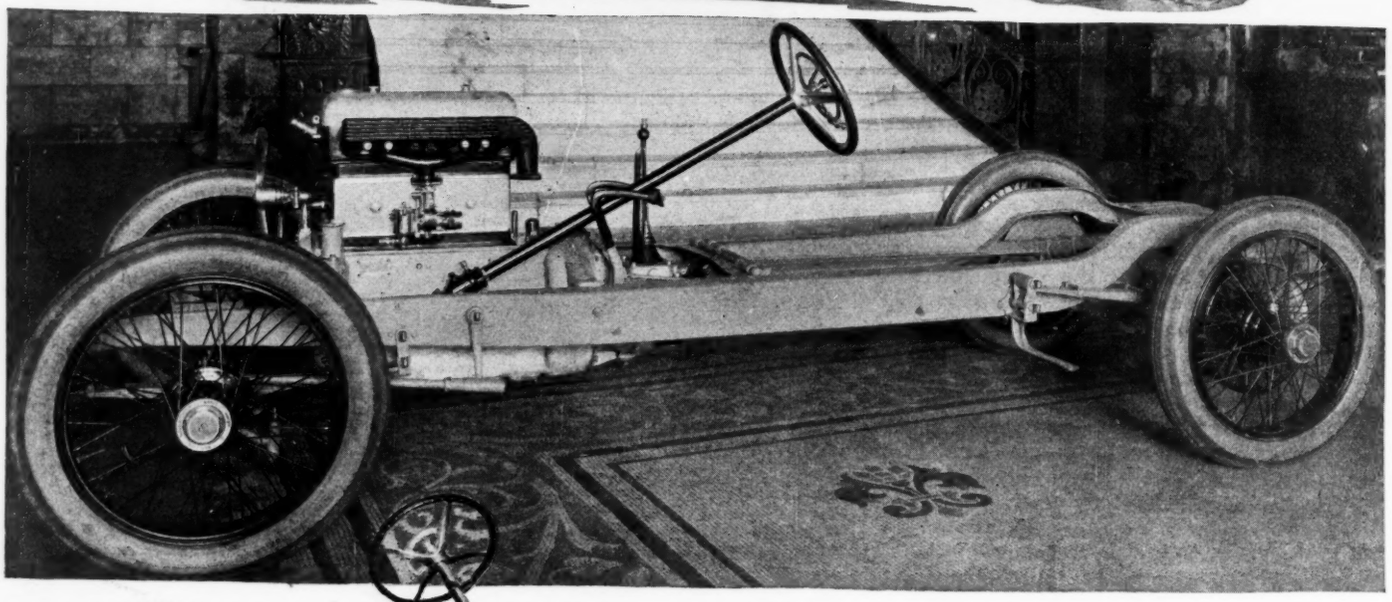
The valves are in the head, with simple, outside adjustment, and are 1⅞ in. diameter and lift 9-32 in. The Wyman-Gordon crankshaft is 1⅞ in. in diameter and has three large bearings. Lubrication is by cam-operated piston pump to the main bearings and front gears, and splash to the cylinders.

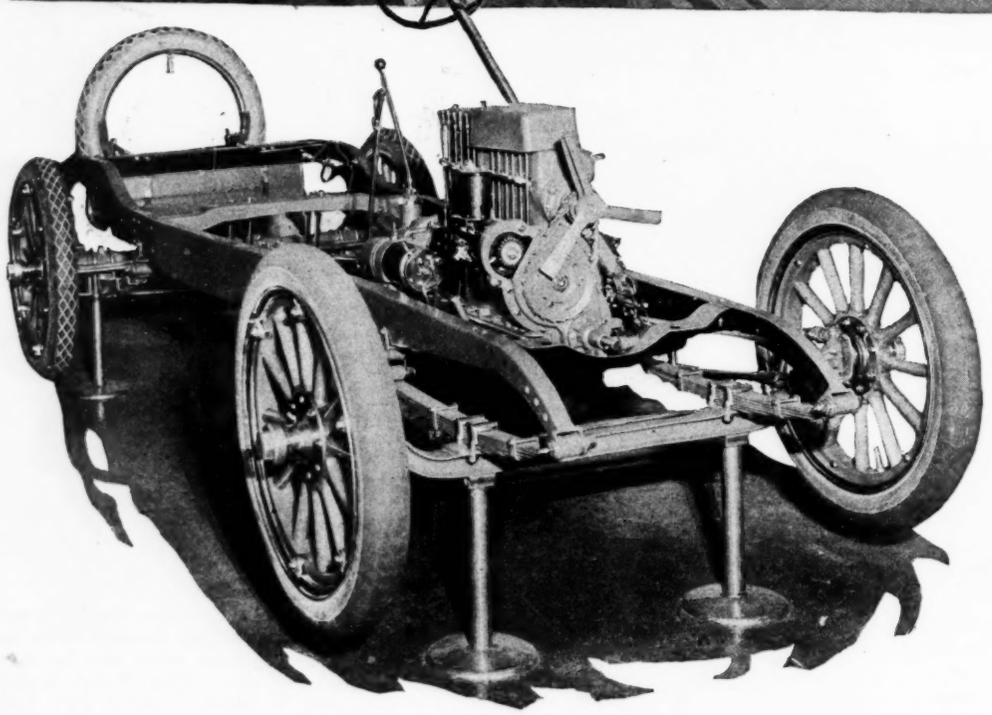
Drive is through a 10-in. Borg & Beck clutch, a Muncie transmission, two 6½-in. flexible disk universal joints with tubular propeller shaft, and a full-floating axle with Brown-Lipe-Chapin differential set. High gear ratio is 4.5 to 1. Wheels are artillery type, of second growth hickory. Each is built of twelve 1⅜ in. spokes. Tires are Fisk, 32 by 3½-in. on the phaeton and 32 by 4 in. on sedan.

Cooling is thermo-syphon, fuel supply by Stewart vacuum system and a 14- gallon rectangular rear tank, the phaeton top is of double texture Neverleek with nickel-plated rear curtain lights. Side curtains swing open with the doors. A 75-mile speedometer, Stewart-Warner, has been found necessary instead of the customary 60-mile indicator.

Genuine leather, tan Spanish, is used for the upholstery of all Maibohm open cars, and they are finished in a handsome dark green, with natural wood wheels. Sedans are upholstered in French gray fabric, and colored a rich dark blue. Bodies are Maibohm-built, of seasoned ash and maple, all joints mortised and tenoned, and glued and screwed, covered with 20-gage prime sheet steel, and welded at the seams.







Three of the new models offered for the coming season. Above is the new Oldsmobile chassis which has been refined in many respects this year. The photograph shows the tendency toward the deep side rails of the frame. In the center is a side view of the H. C. S. chassis which has brought much favorable comment on account of its general clean design, showing a direct influence of European practice. Below is a front view of the Scripps-Booth chassis. The engine in this instance is mounted on the front cross member which is wide enough to make a sort of splasher.



Cars Made *in the* U.S.A. for 1920

EDITOR'S NOTE

MOTOR AGE takes great pleasure this year in publishing a digest of the leading stock body styles offered for sale for 1920 by American manufacturers. It has made this digest just as complete as possible, but it would be manifestly impossible to publish illustrations of all models turned out by all the manufacturers. Selections have therefore been made comprising the principal styles of each company and these have been grouped as to manufacturers this year rather than according to the body styles themselves, as has been customary in the past, the belief being that dealers would find the information in this form more convenient.

THE 1920 CARS IN BRIEF

TWELVE-CYLINDER CARS

Haynes — Packard — Singer

EIGHT-CYLINDER CARS

Apperson	Cole	Daniels	Lafayette	Peerless
Cadillac	Cunningham	King	Oldsmobile	Standard

SIX-CYLINDER CARS

American	Crow-Elkhart	Hudson	Mitchell	Pilot
American Beauty	Davis	Huffman	Monitor	Premier
Anderson	Dorris	Jackson	Moon	Reo
Auburn	Economy	Jones	Moore	Roamer
Begga	Elcar	Jordan	Nash	R. & V. Knight
Bour-Davis	Elgin	Kissel	National	Saxon
Buick	Ferris	KlineKar	Norma	Sayers
Cameron	Franklin	Lexington	Oakland	Scripps-Booth
Case	Geronimo	Liberty	Oldsmobile	Stephens
Chalmers	Grant	Locomobile	Owen Magnetic	Studebaker
Chandler	Hanson	Maibohm	Paige	Velie
Cleveland	Haynes	Marmon	Paterscn	Westcott
Columbia	Hollier	McFarlan	Piedmont	Winther
Comet	Holmes	Metz	Pierce-Arrow	Winton

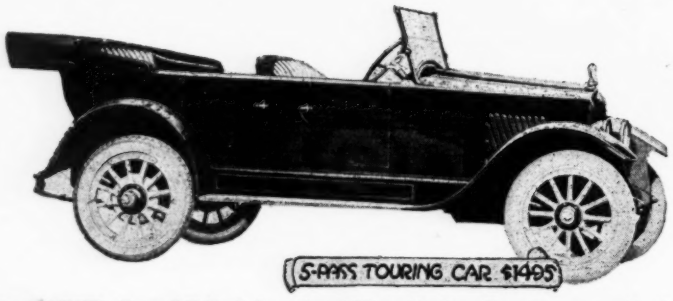
FOUR-CYLINDER CARS

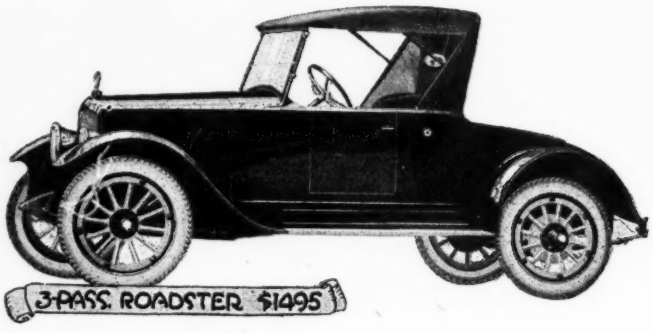
Allen	Crow-Elkhart	Harroun	Meteor	ReVere
Argonne	Dixie Flyer	Harvard	Monroe	R. & V. Knight
Bell	Dodge Brothers	Hatfield	Nash	Seneca
Biddle	Dort	H. C. S.	Nelson	Skelton
Brewster	du Pont	Hupmobile	Olympian	Stearns
Briscoe	Elcar	Lorraine	Overland	Stutz
Champion	Essex	Marshall	Phianna	Templar
Chevrolet	Ford	Maxwell	Piedmont	Tulsa
Commonwealth	Gardner	Mercer	Porter	Willys-Knight

TWO-CYLINDER CARS

Spacke — Stanley (steamer)

ALLEN, 43

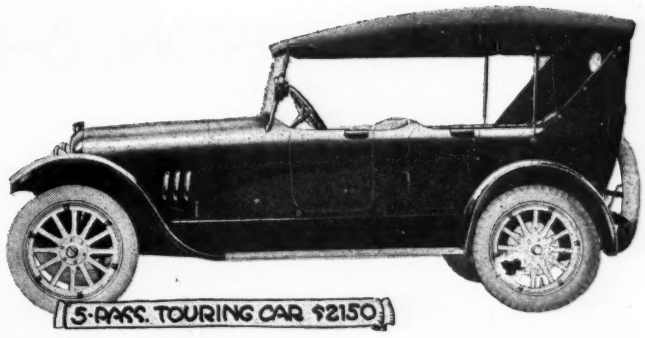




MODEL 3, exhibited by the Allen Motor Co., is an entirely new car from the model exhibited in 1919, both as to chassis and engine design. It carries a new engine, transmission, axles, frame, steering gear, gasoline tank and radiator. The engine is 3½ by 4 in. bore and stroke and is four cylinder. A great deal of attention has been paid to accessibility

AMERICAN BEAUTY





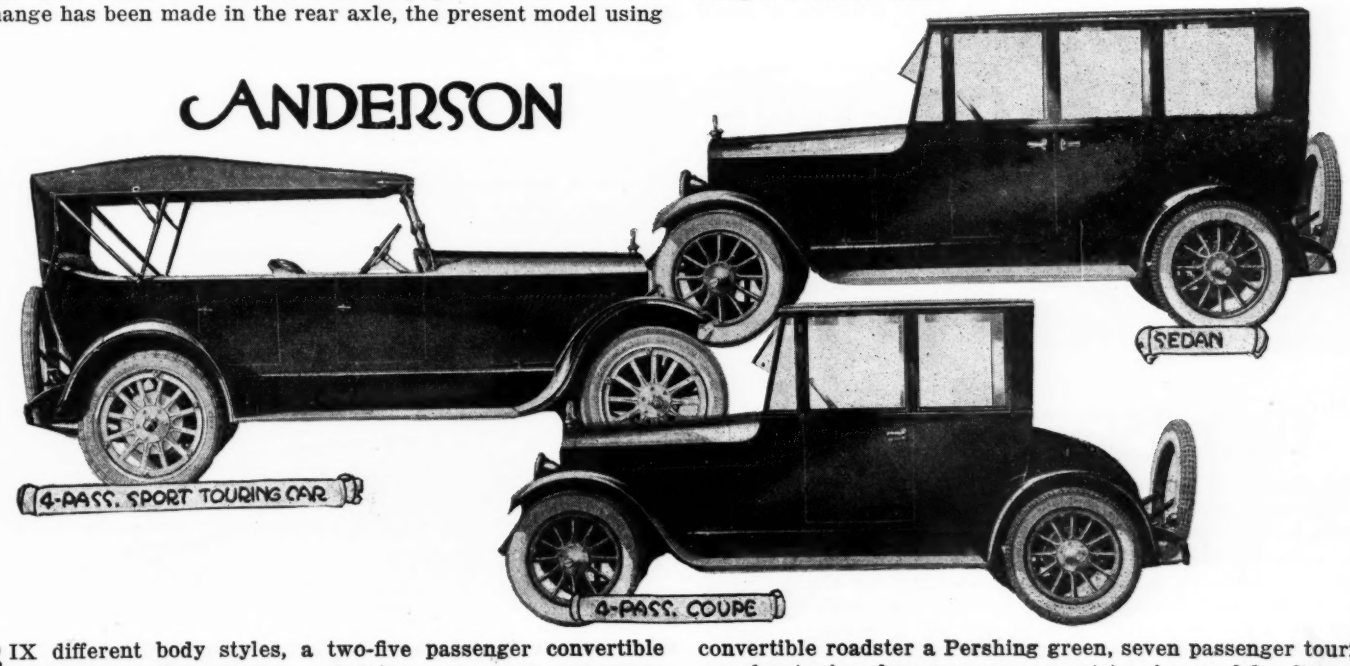
THE 1920 American Beauty body is a streamline design with low panels and high cowl. It comes in maroon, gun metal gray, light blue and dark blue. Its wheel base is 121 in. and road clearance 11 in. In its makeup it uses a Continental engine, Borg & Beck clutch, Detroit transmission, Timken axles, Westinghouse starting, lighting and ignition and Firestone 34 by 4½ in. tires. Wick oiling devices are used on the spring shackle bolts and also the steering knuckle pins. The company will make in addition to the touring car and roadster a sedan.

AMERICAN



THE 1920 American will be produced without any radical changes except a few refinements. The present model has a 122 in. wheelbase and is powered with a six-cylinder engine of 3¼ by 5 in. The tires are 32 by 4 in. The transmission is a Grant-Lees and the steering gear a Ditweiler. A change has been made in the rear axle, the present model using a Columbia. Hotchkiss drive is used and other features of the car include a Borg & Beck clutch, Zenith carbureter and Stewart vacuum tank. The American line for this year include the five-passenger touring and six-passenger sextet, the latter being a two-door sedan.

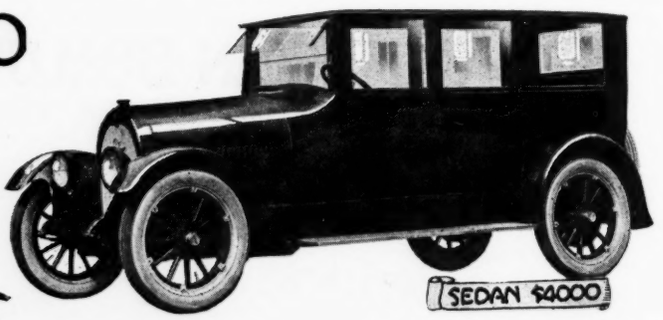
ANDERSON



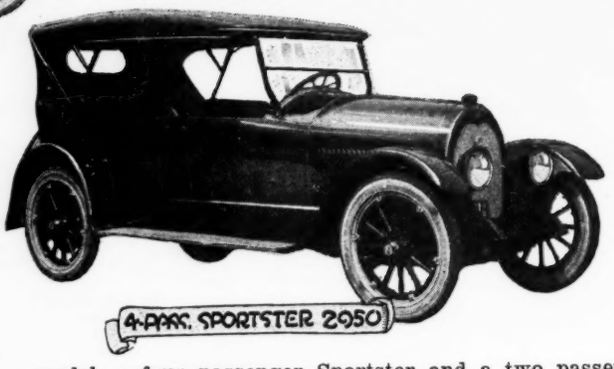
SIX different body styles, a two-five passenger convertible roadster, a five passenger touring car, seven passenger touring car, four passenger sport touring car, a four passenger coupe and a five passenger car Sedan are exhibited by the Anderson Motor Co. Each type is painted in a different color, the convertible roadster a Pershing green, seven passenger touring car claret wine, four passenger sport touring model a Celestial blue; five passenger touring car a Brazilian blue and the coupe and Sedan a Marine green. The Series 30, being exhibited this year, is using the new model 7R Continental engine.

APPERSON, 8-20









THIS company is devoting itself to the exclusive manufacture of an eight-cylinder model. On one chassis it will build two types of cars, the Apperson Anniversary model and the standard job. The Anniversary model is furnished in both a seven passenger touring car and a four passenger Tourster. The standard model is built in a seven passenger touring model, a four passenger Sportster and a two passenger Ace model, all three of which list at $3250. Enclosed models of all types are furnished in either the Anniversary or standard models. The new Apperson bodies present the latest trend in design and carry the best equipment.

AUBURN, 6-39-H

LINES of the Auburn have not been changed greatly. Five body types are offered, a five passenger touring, four passenger Tourster; five passenger Sedan; four passenger coupe and two passenger Roadster, mounted on the same chassis as the 1919 models, the 639. Finish is Royal Blue or Purple Lake for the bodies and hood with fenders and trimmings black enamel. Alternative colors for all models are furnished in Auburn grey and the two passenger roadster in Auburn blue without additional charge. The fenders are crowned of extra heavy gage rolled patented flattened steel.



ARGONNE

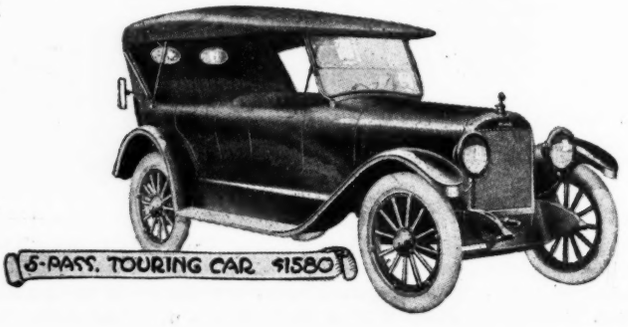


THE Argonne four-cylinder car is new this year. It is a two-passenger sport model fitted with a high speed engine of 3¾ by 5⅛ in. The car is a product of the Argonne Motor Car Co,, Jersey City, Mich., which will produce this model together with a four-passenger open sport model. The roadster sells for $4500 and the four-passenger $4700. The wheelbase is 118 in.

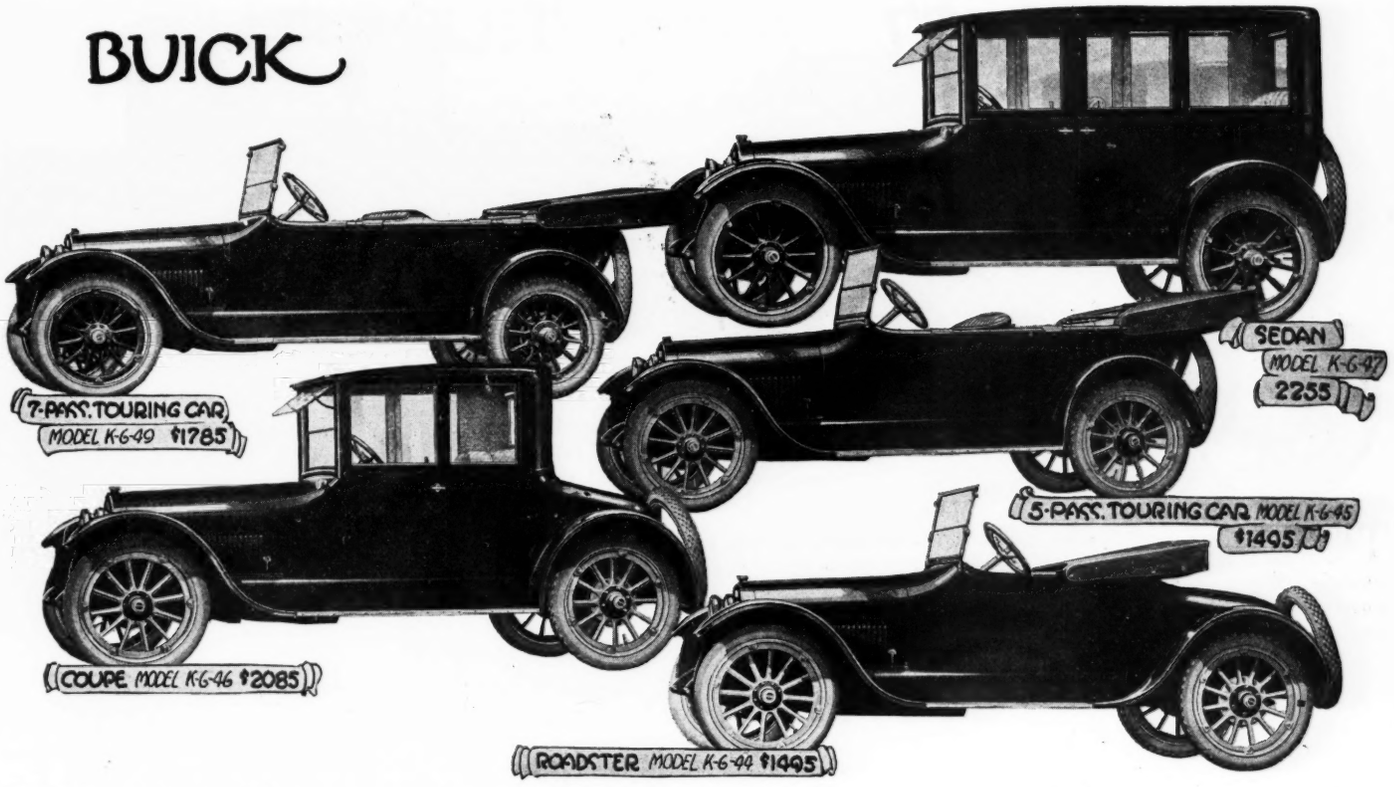
Accessibility is one of the features on the Argonne. It is not necessary to remove the radiator, bottom of crankcase, or bellhousing to make simple adjustments or repairs, nor are any of the lubricated parts so situated that one must crawl underneath the car for necsesary attention.

BEGGS

THE Beggs car is continued for 1920 practically unchanged. The car uses standard units such as Continental engine, Borg & Beck clutch, Timken axle, Connecticut ignition, Stromberg carbureter, etc. It is a 120 in. wheelbase car and has among its features self-lubricating bushings in the steering gear, 52 in. underslung springs, a boat-type body, junction boxes for easy inspection of wiring, and a curved radiator blending with hood and body. A Stewart speedometer is driven from the transmission and the car comes with a very complete equipment, including Macbeth-Evans green visor lens for the headlights. Tires on this car are 33 by 4 in.



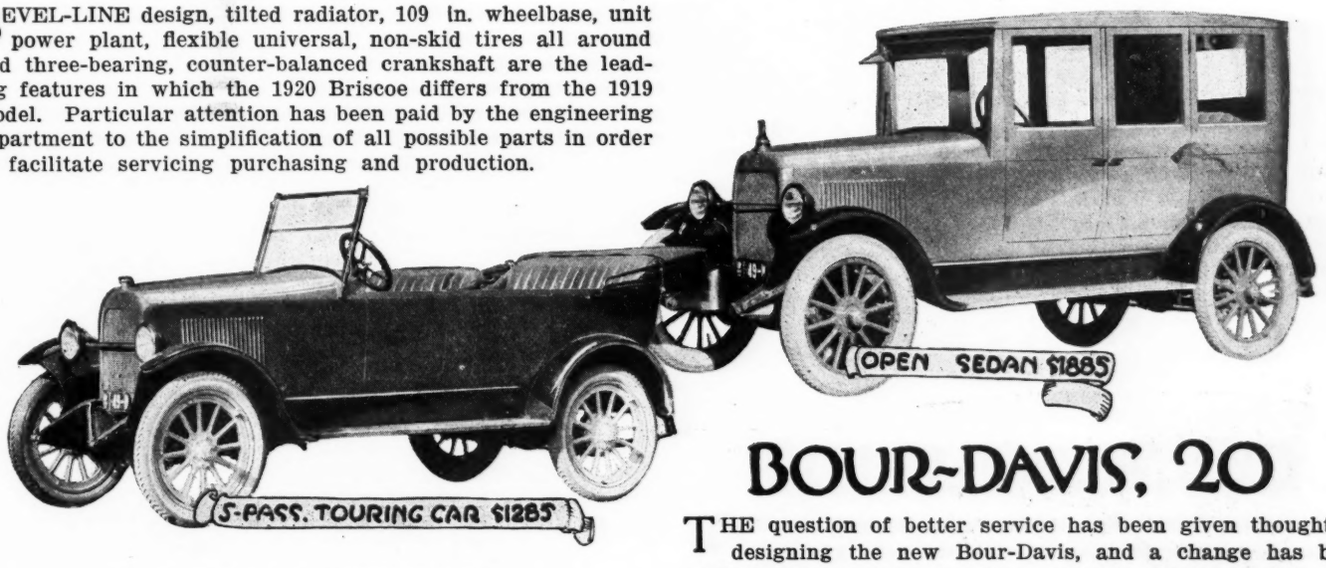
BUICK



BUICK models for 1920 bear no marked changes from the 1919 models. The most important changes consist of a flatter spring layout and the body height at the rear has been lowered 1 in. by this. A slight change also has been made in the speedometer drive from the transmission case. The same five and seven-passenger chassis models with wheelbases respectively of 118 and 124 in., using the same engine, 3⅜ by 4½ in., are continued. They have mounted on them a three-passenger roadster, five-passenger touring, touring coupe and a five-passenger sedan on the smaller chassis. The larger has a seven-passenger touring and seven-passenger sedan. Minor changes in the engine consist of the removal of the oil well wing plug, changing oil pump drive shaft from cold-rolled steel to die-cast bronze and slight alteration in the fan and belt drive. Other minor improvements on the chassis include improved oil and gasoline tank fillers and a lower hanger to accommodate the Willard type S-J-W-N-4 battery. The headlamps are changed slightly and the switch on the instrument board has a new mounting.

BRISCOE

BEVEL-LINE design, tilted radiator, 109 in. wheelbase, unit power plant, flexible universal, non-skid tires all around and three-bearing, counter-balanced crankshaft are the leading features in which the 1920 Briscoe differs from the 1919 model. Particular attention has been paid by the engineering department to the simplification of all possible parts in order to facilitate servicing purchasing and production.



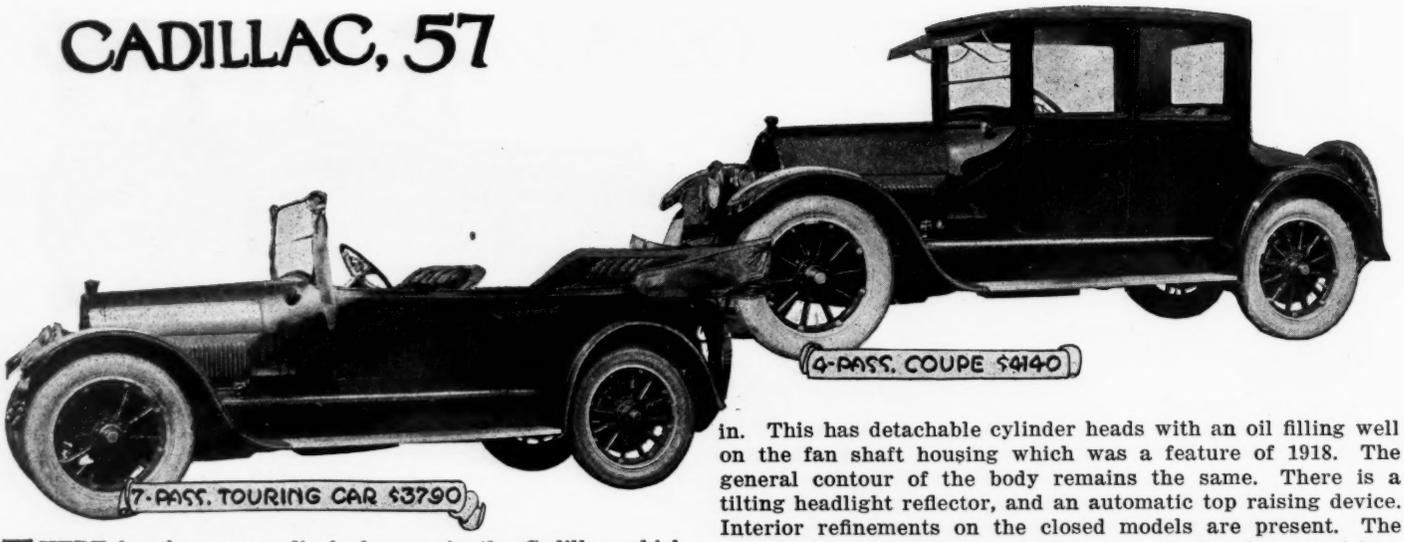
BREWSTER

SEVERAL minor changes have been made in the design of the Brewster car but in the main the car stands as previously built. The Brewster has changed to a Stromberg carbureter and Berling magneto, still maintaining the U. S. L. starting and lighting system. The Brewster is not an assembled car, virtually all of it being built by the company.

BOUR-DAVIS, 20

THE question of better service has been given thought in designing the new Bour-Davis, and a change has been made in the hook-up for the generator, starting motor, etc., making them much more accessible. The new model will have a longer wheelbase and a deeper frame, the latter being 7 in. Regarding the use of heavier fuels, a new carbureter has been added, together with hot-spot manifold. The Westinghouse starting and lighting system has been adopted and Firestone rims. A change has been made in the clutch, this being now a thirteen disk type.

CADILLAC, 57



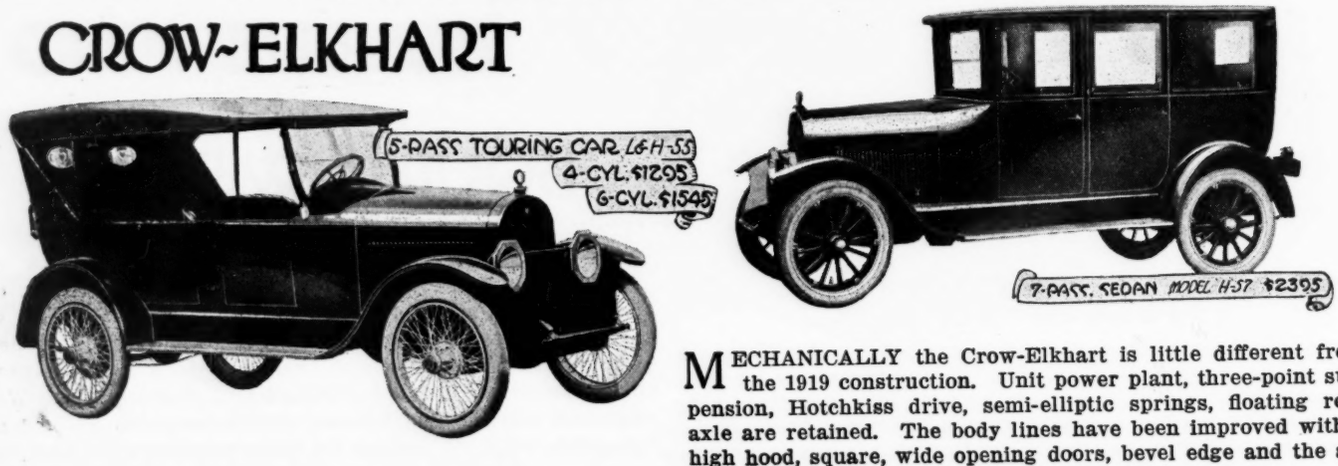
THERE has been no radical changes in the Cadillac which will be out for 1920 with its usual quota of open and closed models, all mounted on the type 57 chassis. This is in accordance with the company's policies for the last four years. The engine is an eight-cylinder with bore and stroke of 3⅛ by 5⅛ in. This has detachable cylinder heads with an oil filling well on the fan shaft housing which was a feature of 1918. The general contour of the body remains the same. There is a tilting headlight reflector, and an automatic top raising device. Interior refinements on the closed models are present. The notable feature, as in the previous year, is the absence of lace or braid in the upholstering of the body, the binding material being the same as the plain material.

CASE, V



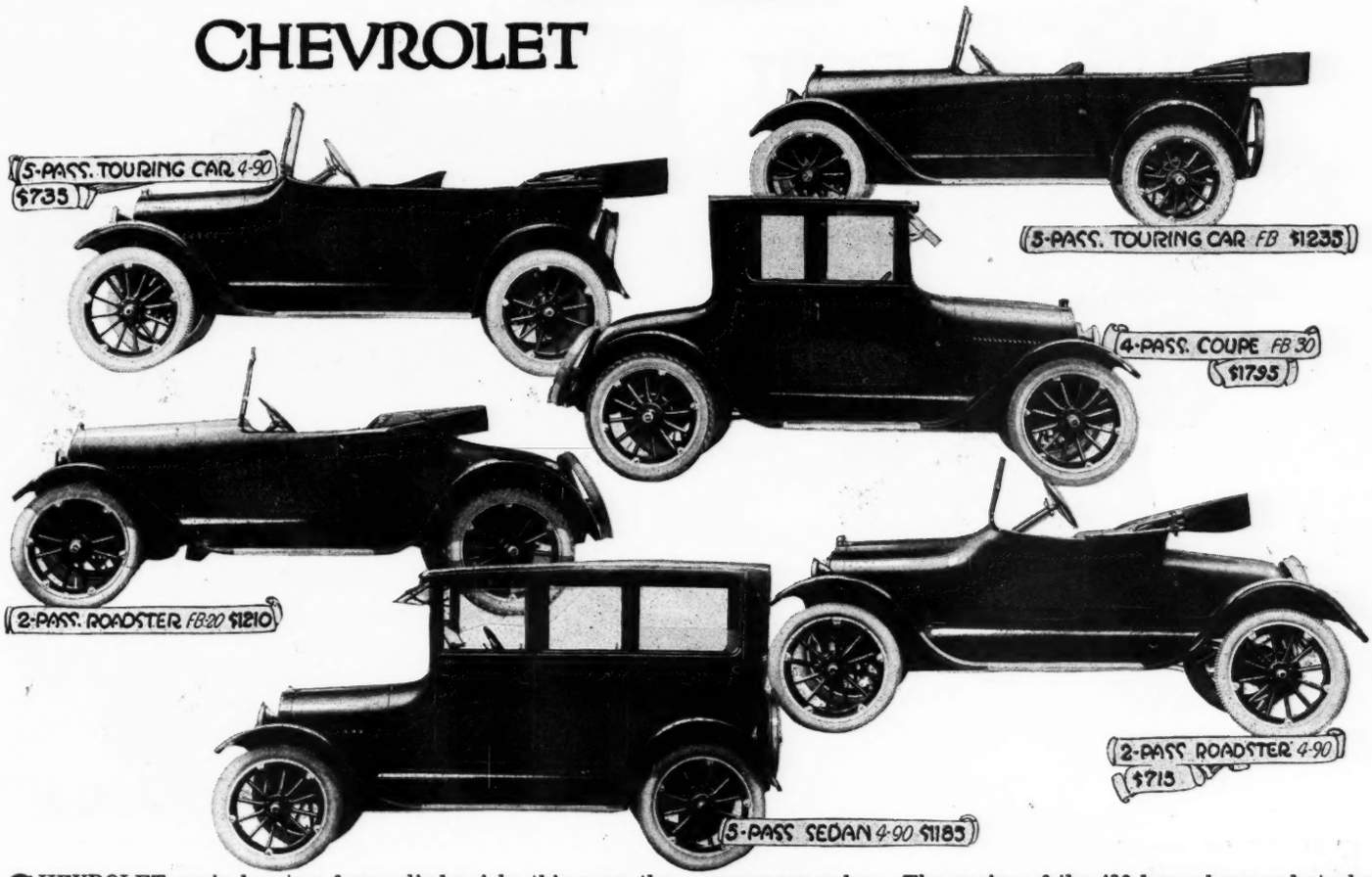
SEVERAL changes have been made in the Case line for 1920, both in body and mechanical construction. A seven passenger touring car, a four passenger sport car, a four passenger coupe and a seven passenger sedan have been added to the body line. The 1920 models are 126 in. wheelbase, 1 in. longer than 1919 and have 34 by 4½ in. tires as regular equipment. Stronger fenders have been adopted and in conformity with the longer wheelbase, the bodies have been lengthened a trifle. The touring model, for example, has a one-piece front seat instead of the divided seats formerly used. Mechanically, also, the 1920 line has been changed considerably. The engine this year is a six-cylinder Continental of 3½ by 5¼ in. bore and stroke to which is fitted a Borg & Beck clutch with a Grant Lees three-speed transmission. A Rayfield carbureter is used and a Westinghouse dynamo. Ignition this year is Delco. The Alemite lubrication system is added this year.

CROW-ELKHART



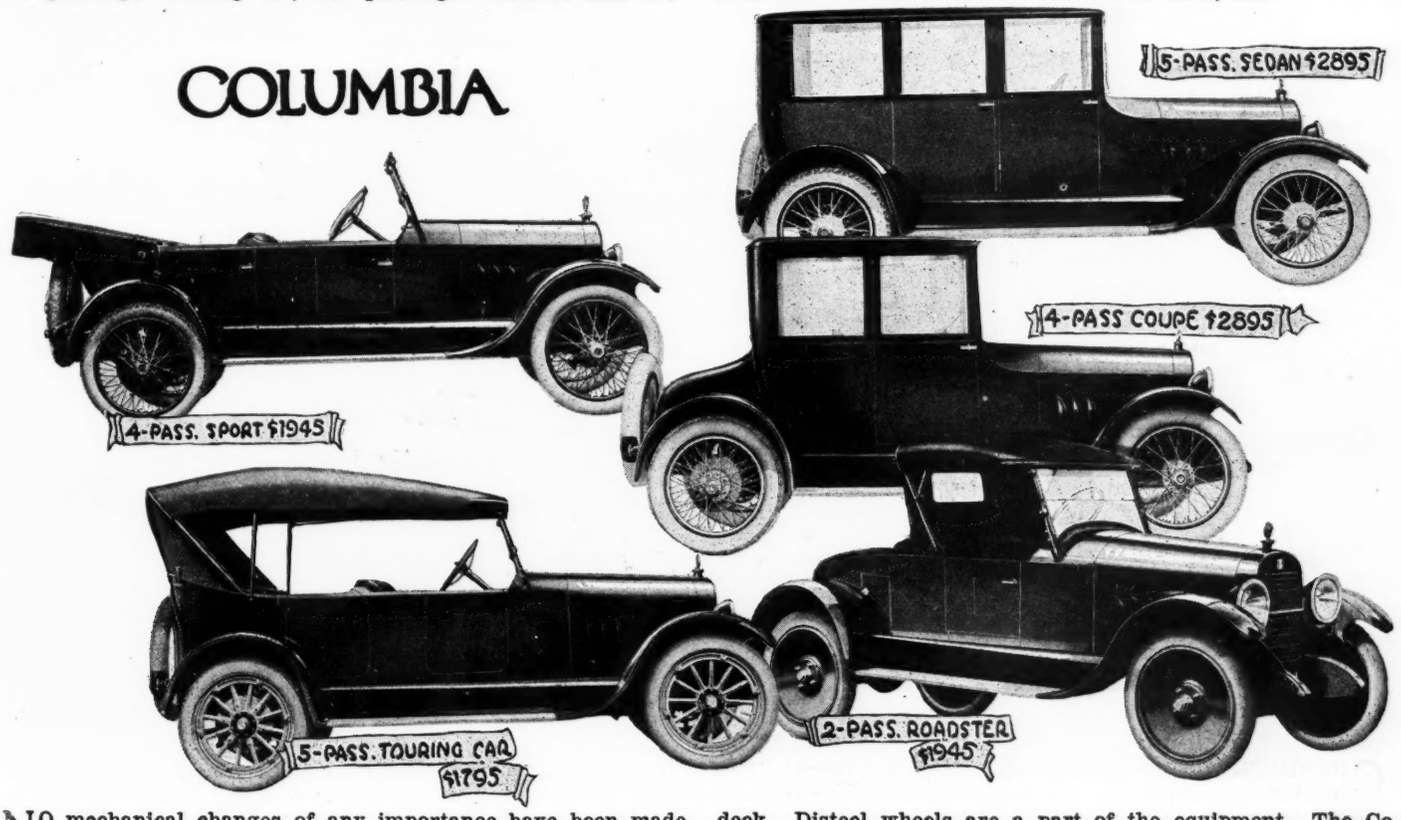
MECHANICALLY the Crow-Elkhart is little different from the 1919 construction. Unit power plant, three-point suspension, Hotchkiss drive, semi-elliptic springs, floating rear axle are retained. The body lines have been improved with a high hood, square, wide opening doors, bevel edge and the appointments have been considerably improved.

CHEVROLET



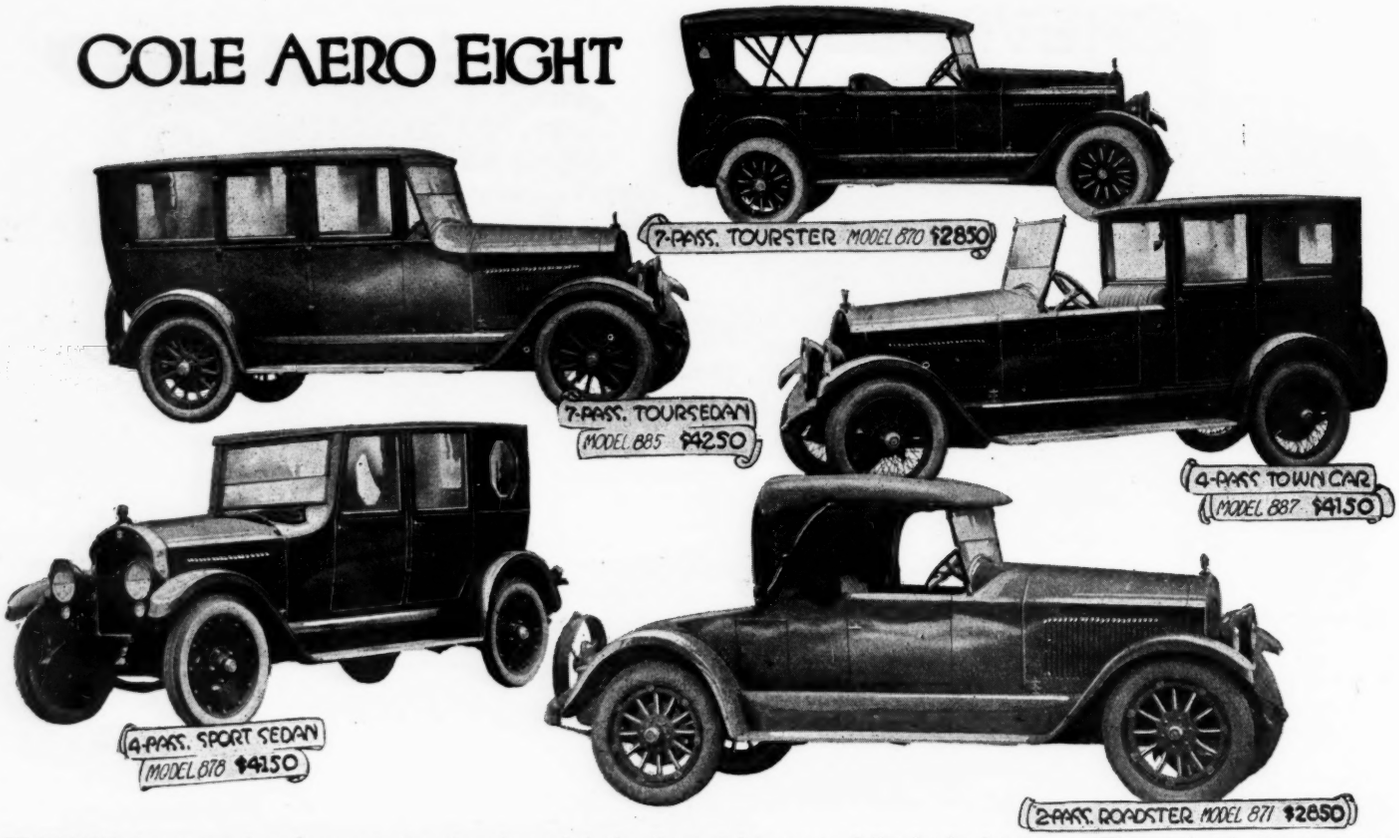
CHEVROLET again has two four-cylinder jobs this year, the 490 and the FB. The 490 comes in a five passenger touring, two passenger roadster, five passenger open sedan and the two passenger coupe. The FB comes in three body types, a five passenger touring car, two passenger roadster and five passenger sedan. The engine of the 490 has a bore and stroke of 3 11/16 by 5¼ in. Model 490 has a wheelbase of 102 in., 30 by 3½ in. tires, gravity fuel feed, while model FB has a wheelbase of 110 in. and 33 by 4 in. tires and vacuum feed. Otherwise the chassis are the same as to units, etc.

COLUMBIA



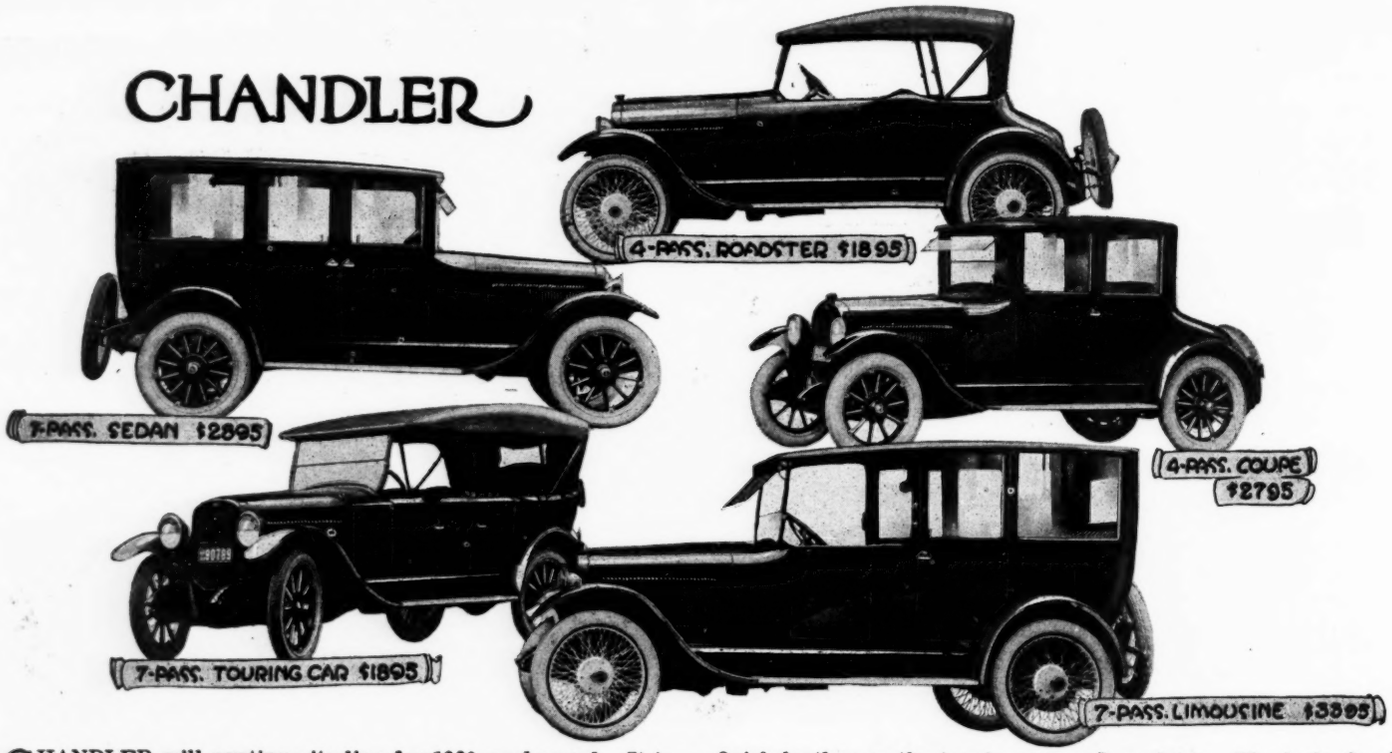
NO mechanical changes of any importance have been made in the Columbia for this season, but two new models have been added, a two-passenger roadster and four-passenger coupe. The roadster body has sweeping lines unbroken from front to rear, with a novel spare tire carrier sunk into the back deck. Disteel wheels are a part of the equipment. The Columbia chassis uses standard units as Continental and Rutenber engines, Detroit Pressed Steel frame, Durston transmission, Gemmer steering, Borg & Beck clutch, Spicer universals, radiator with Sylphon thermostatically controlled shutters.

COLE AERO EIGHT



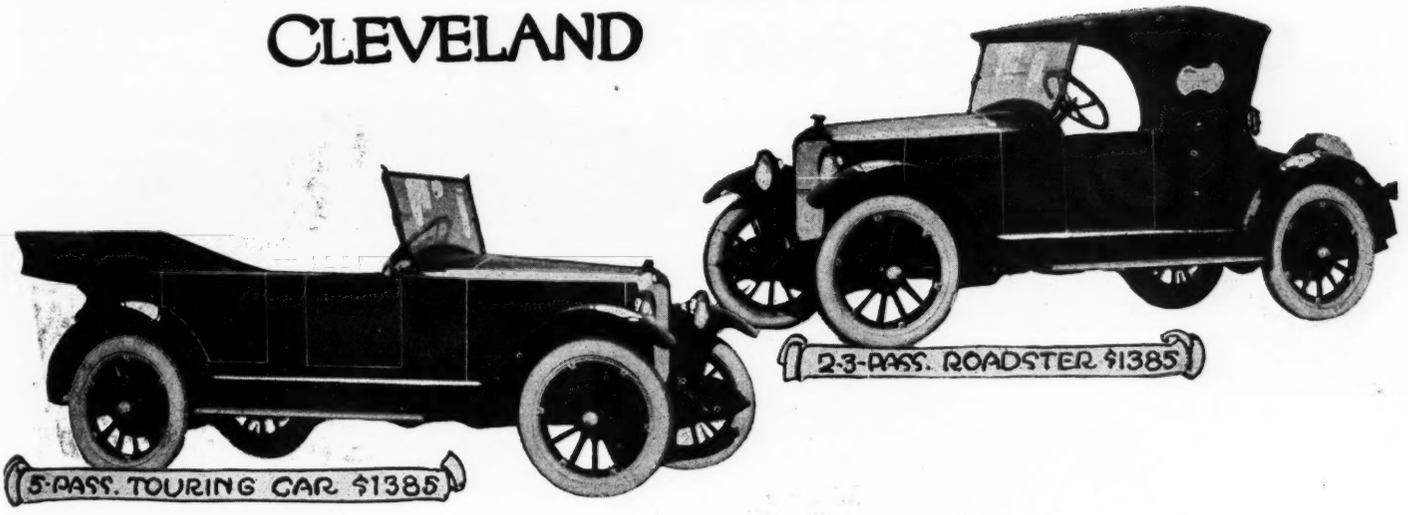
EXCEPT for several refinements in chassis and body the Cole Aero Eight will appear in much the same manner as its predecessor. A one-piece housing is now used for the rear axle which in tests has proven to be 60 per cent stronger than the one formerly used and affords a more positive brake action. A new brake adjuster has been added which automatically takes care of the brake leverage. The engine is the same excepting that a Johnson carbureter has been employed. On the closed models automatic window regulators are used for proper ventilation and on models 884 and 885 the new stormproof windshield can be adjusted to give protection in all kinds of weather.

CHANDLER



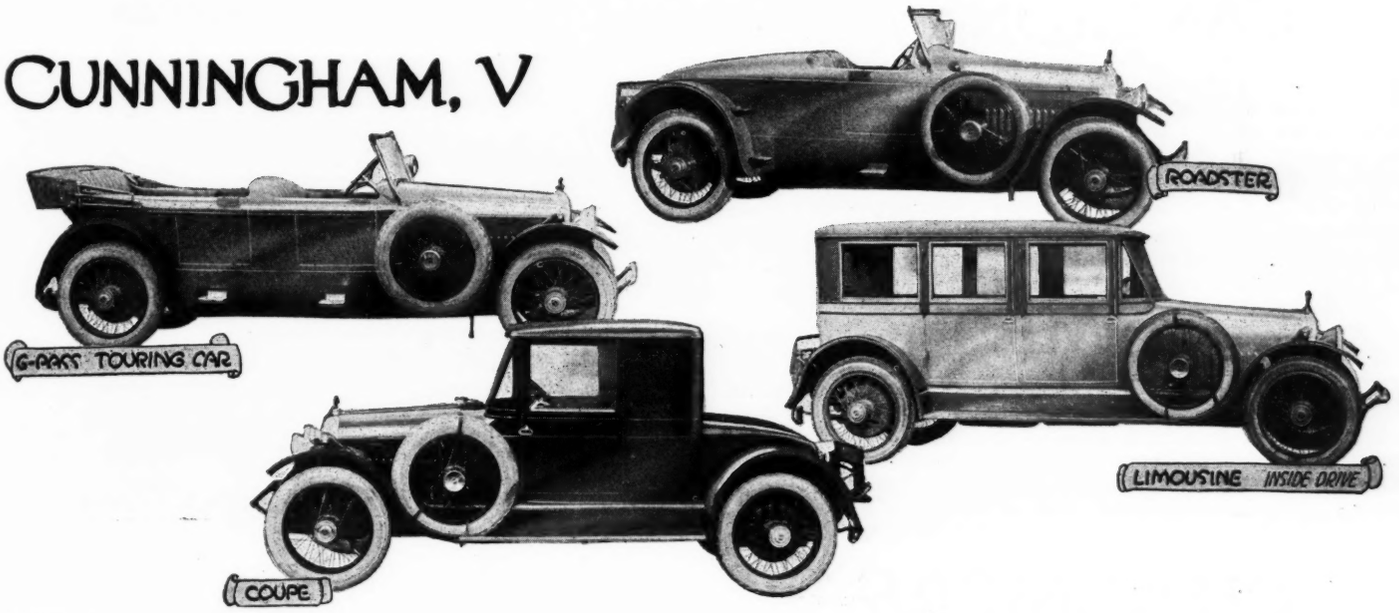
CHANDLER will continue its line for 1920 unchanged. It includes a seven-passenger touring car, four-passenger roadster, four-passenger Dispatch model, seven-passenger sedan, four-passenger coupe and limousine. The new series Dispatch model is a snappy design of sport car with a long bevel-edge body, clear vision side curtains opening with doors, plate glass rear light and is upholstered in the same hand-buffed bright finish leather as the touring car and roadster. The body, hood and radiator are painted a rainbow blue. The closed car bodies have square cornered doors and windows. The lower windshield panel is curved to follow the high rounded cowl. Windows are plate glass and adjustable by automatic lifts. The upholstery is silk plush and all hardware in the sedan and coupe is of Colonial design dull silver finish.

CLEVELAND



THE Cleveland line includes a five-passenger touring car, three-passenger roadster, four-passenger coupe and five-passenger sedan. All are on the standard chassis of 112 in. wheelbase, which is powered with a six-cylinder valve-in-head engine of 3 in. bore and 4½ in. stroke. Tires are 32 by 4 in. on wood wheels, with wire wheels optional. A Gray & Davis starting and lighting system is used, Stromberg carbureter, disk clutch, floating axle, semi-elliptic springs and all bearings are Timken. Dust proof oil cups are fitted to the chassis within easy reach. The lines of the body are straight and upholstery is deep and of hand-buffed leather. The windshield is tilted slightly backwards.

CUNNINGHAM, V



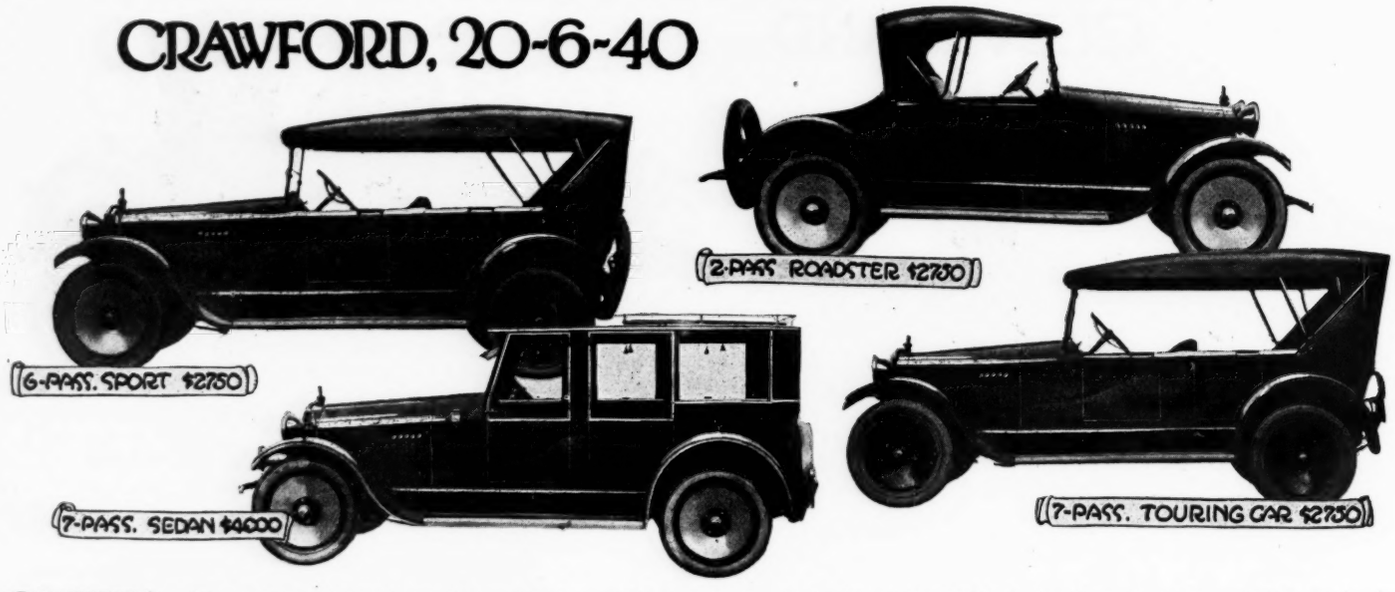
THE Cunningham chassis, except for a few refinements, remains the same as for 1919. The eight-cylinder engine has the largest piston displacement of any twin engine of American made cars. A feature of these cars is the sod pan which extends underneath the car for its entire length. The spare tires instead of being carried on the rear, are now placed on the side of the car. Only the trunk rack is on the rear. The open body styles include a four-five, six- and seven-passenger touring car and a special roadster of the speedster type capable of 85 m. p. h. The closed cars are the town car, landaulet and limousine. All are on a 142 in. wheelbase chassis. Semi-bevel line characterize the touring car.

COMMONWEALTH, 4-40

THE 1920 Commonwealth uses a 3½ by 5 in. four-cylinder Lycoming engine and is a five-passenger car. It has been refined and is designed to meet the demands for a light weight quality car. Its specifications include a chassis of 117 in. wheelbase with 32 by 4 in. tires and wood wheels. It has a Borg & Beck clutch, a Carter carbureter, Peru axle and C. A. S. steering gear. The outstanding change in this year's car is the adoption of the four-cylinder in place of the former six-cylinder engine.

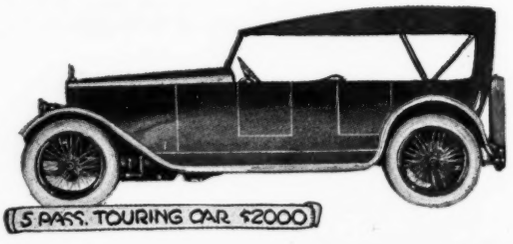


CRAWFORD, 20-6-40



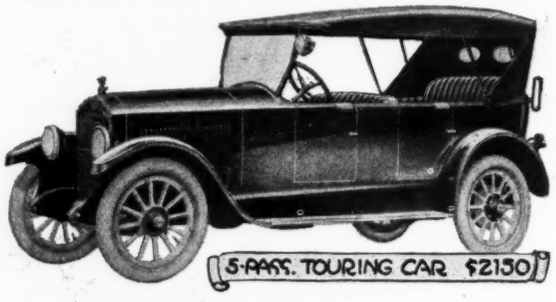
CRAWFORD will continue to put on the market a custom-built seven-passenger car following the same line as formerly, with minor changes only. The car has a Continental engine, Timken axles and other well known units. Disk wheels are furnished shod with Silvertown cord tires, 32 by 4 in. The body is built with divided front seat and upholstery is in leather. The finish is black, with natural finish wood wheels, when these are furnished. The wheelbase is 122½ in. Other features of this car include Westinghouse and Bosch magneto, Gemmer steering, Stromberg carbureter and disk clutch.

CAMERON, 55



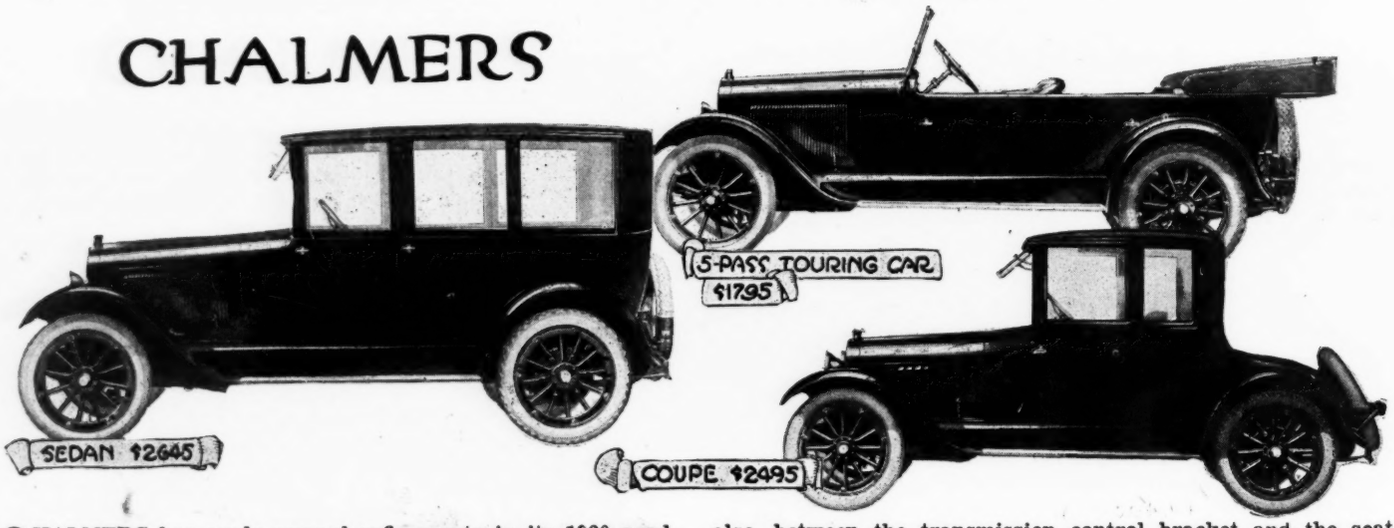
THE Cameron air-cooled car will appear for 1920 practically unchanged. The company makes a sport roadster and light touring car, the former having a wheelbase of 108 in. and the latter 118 in. The feature of the car is its air-cooled engine, which is a six-cylinder with a bore and stroke of 2 15/16 in. by 4½ in. A single camshaft in the lower part of the crankcase operates the valves through three surface cams, the valves being placed horizontally in detachable cages.

COMET



THE Comet Automobile Co. is making an entirely new chassis design in which is being put a heavier frame and the suspension in the rear will be changed from cantilever to a semi-elliptic spring. The company has also under contemplation several other changes in design, but has not yet made formal announcement of what these changes will consist.

CHALMERS



CHALMERS has made several refinements in its 1920 product, including a change in the body design which has taken away the brake at the cowl and provided more comfort for the driver, that is, more real clearance. There is more clearance also, between the transmission control bracket and the seat heel board. The windshield has been changed to fit the body closer and provide better means for fastening curtains. The engine and chassis are practically the same as before.

CHAMPION

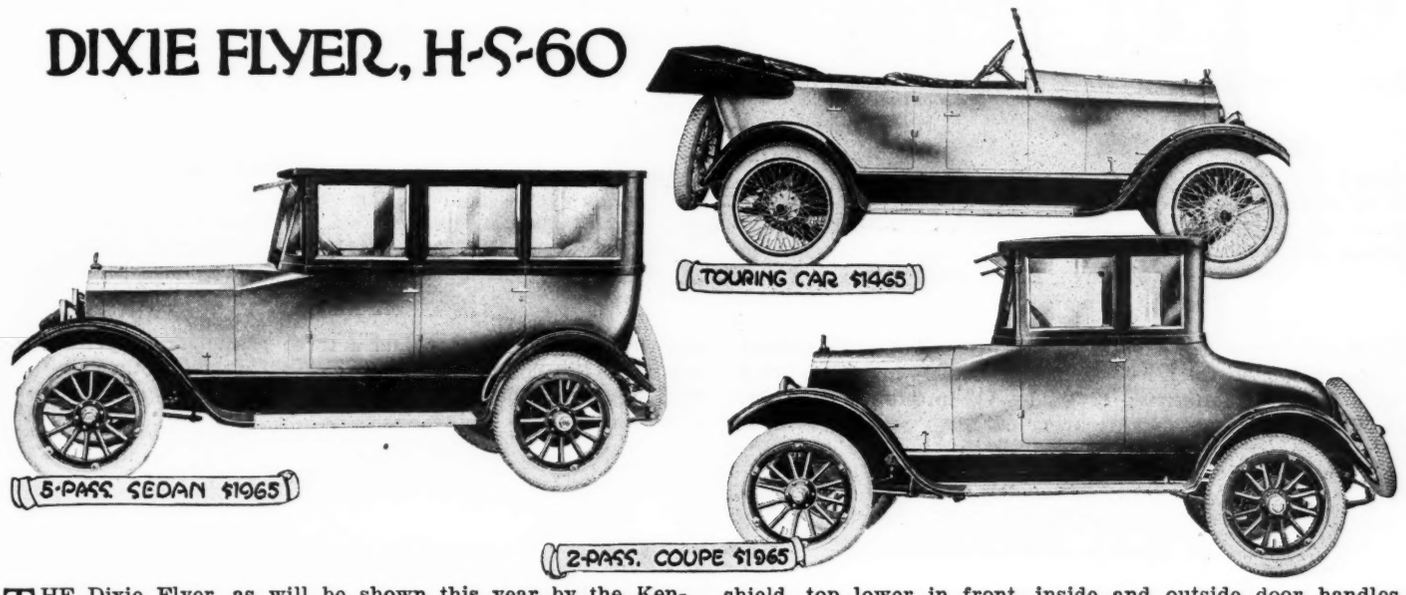
CHANGES in the Champion car for 1920 include the adoption of the Grant-Lees transmisson and the Herschell-Spillman engine, the latter being the same size as the Lycoming engine used in the tourist model of this car. The concern also is standardizing on the Borg & Beck clutch this year. The special Champion will have a triple jet Carter carbureter and the tourist model a Zenith. The special model also now uses a Parish & Bingham frame with a side rail of 1 in.

DuPONT, A



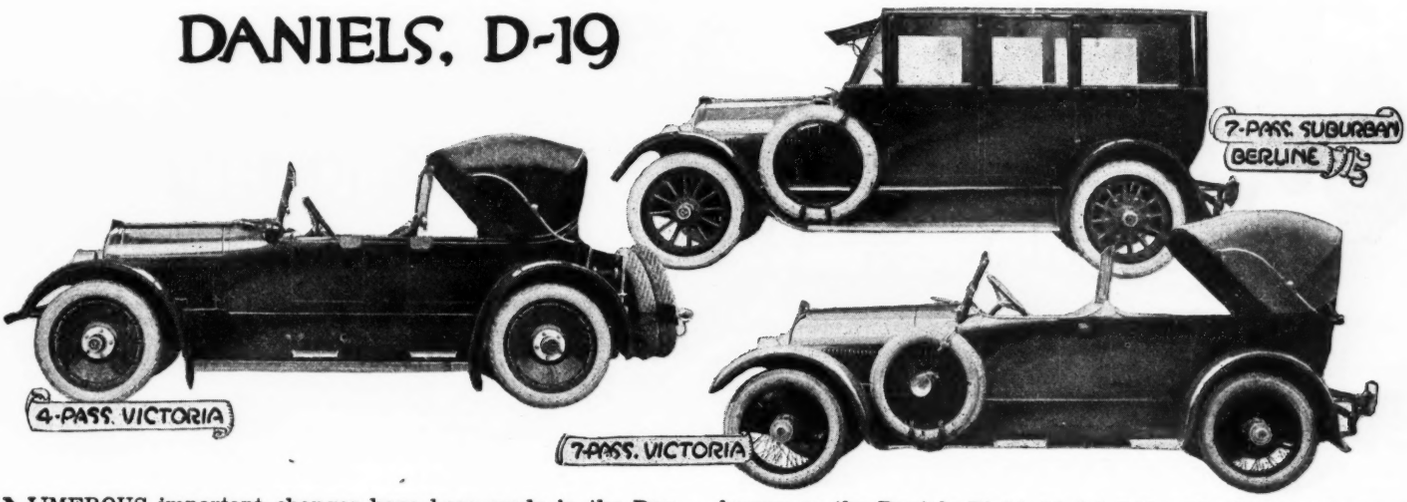
DUPONT offers for 1920 a 124-in. wheelbase job that looks very European. Some of the chassis features include aluminum pistons, semi-eliptic springs and special forms of hangers, disk clutch, four-speed transmission, 16-in. brake drums, and a frame made up of two side rails, four cross members and two cross tubes. The engine is a four-cylinder, L-head, 3 15/16 by 5⅛ in. The wheels are wood with tires 32 by 4½ in. One of the features on the instrument board is a radiometer. The body is unique in that the sides are concave instead of convex as in conventional car design.

DIXIE FLYER, H-S-60



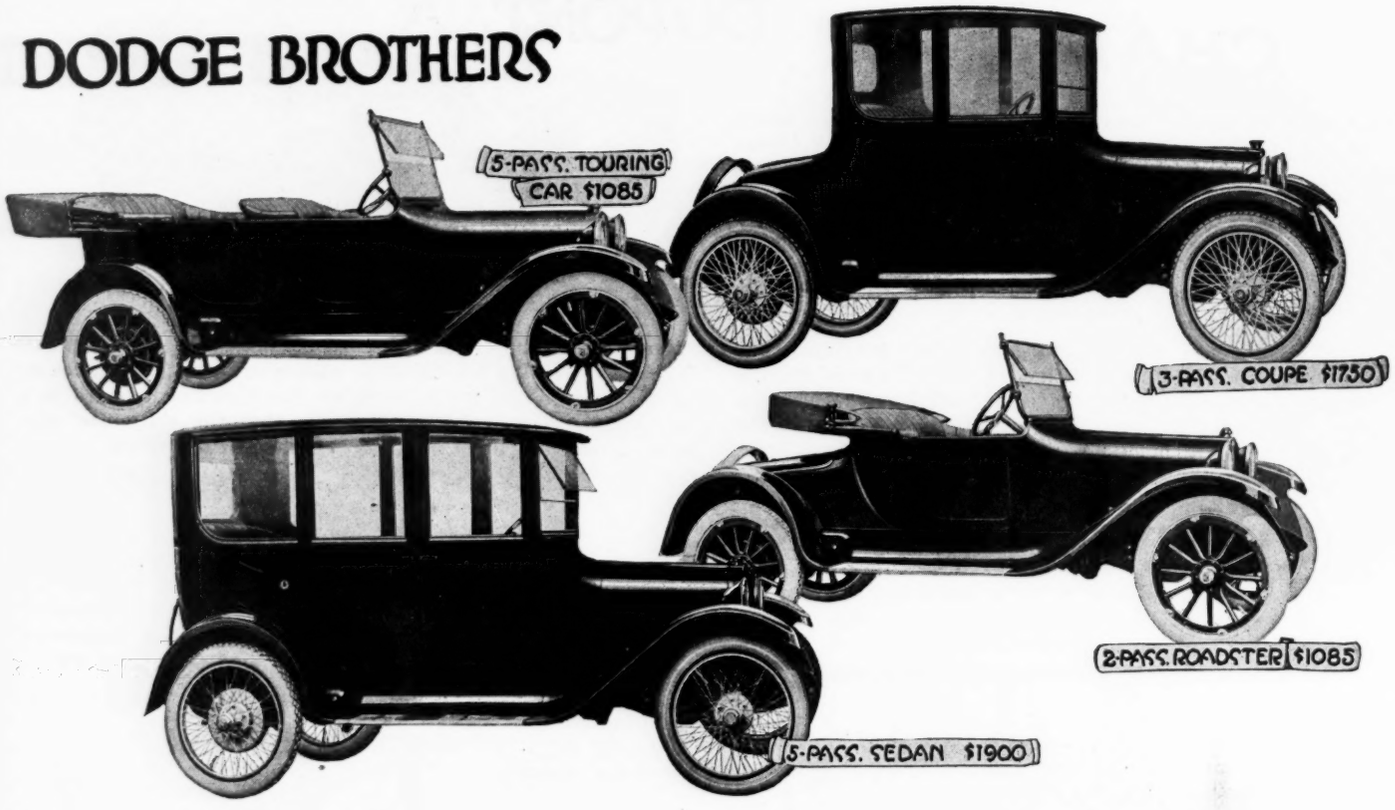
THE Dixie Flyer, as will be shown this year by the Kentucky Wagon Mfg. Co., contains many improvements over last season. The car is powered with a four-cylinder Herschell-Spillman engine of 3¼ by 5 in. bore and stroke and complete equipment is furnished with all models. Body changes recently announced include bevel edge, Gypsy curtains, large oblong plate glass in rear curtain, sloping windshield, top lower in front, inside and outside door handles, gasoline gage in center of tank, separate filler cap, lift-the-dot fasteners, linoleum covered running boards, long gear shift levers, deeper seats, double padded with heavier seat springs, and concealed hinges in the hood. The mechanical changes include 4¾ to 1 nickel steel spiral gears, larger cutouts and more conveniently arranged equipment.

DANIELS, D-19



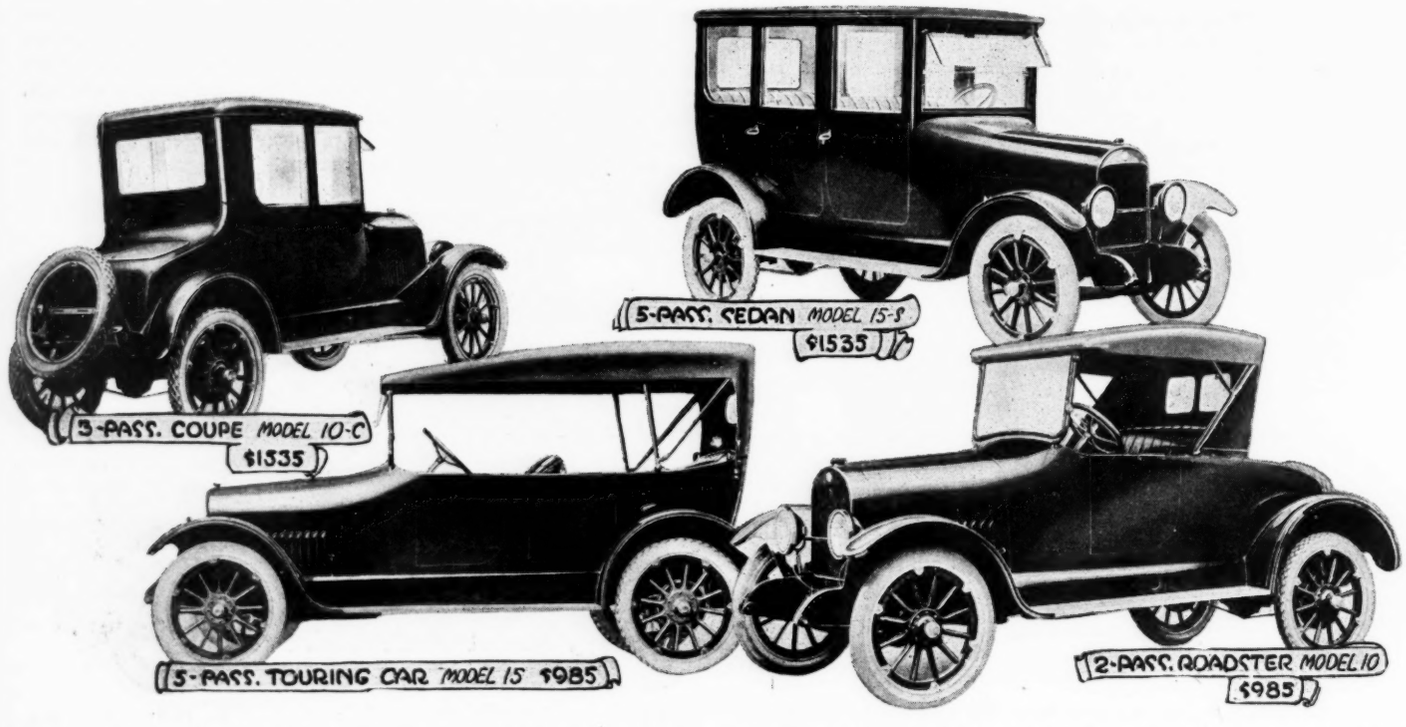
NUMEROUS important changes have been made in the Daniels for 1920. The company is now manufacturing its own engine and transmission. The new engine is an eight-cylinder job of 3½ by 5¼ in. bore and stroke and is equipped with Delco lighting, starting and ignition system. The new car is known as the Daniels Eight, Model D19. The body styles are five and seven passenger touring, four passenger close coupled touring, three passenger roadster, limousine, suburban limousine, brougham, landau brougham, sedan and a collapsible winter roadster. Special bodies to order.

DODGE BROTHERS



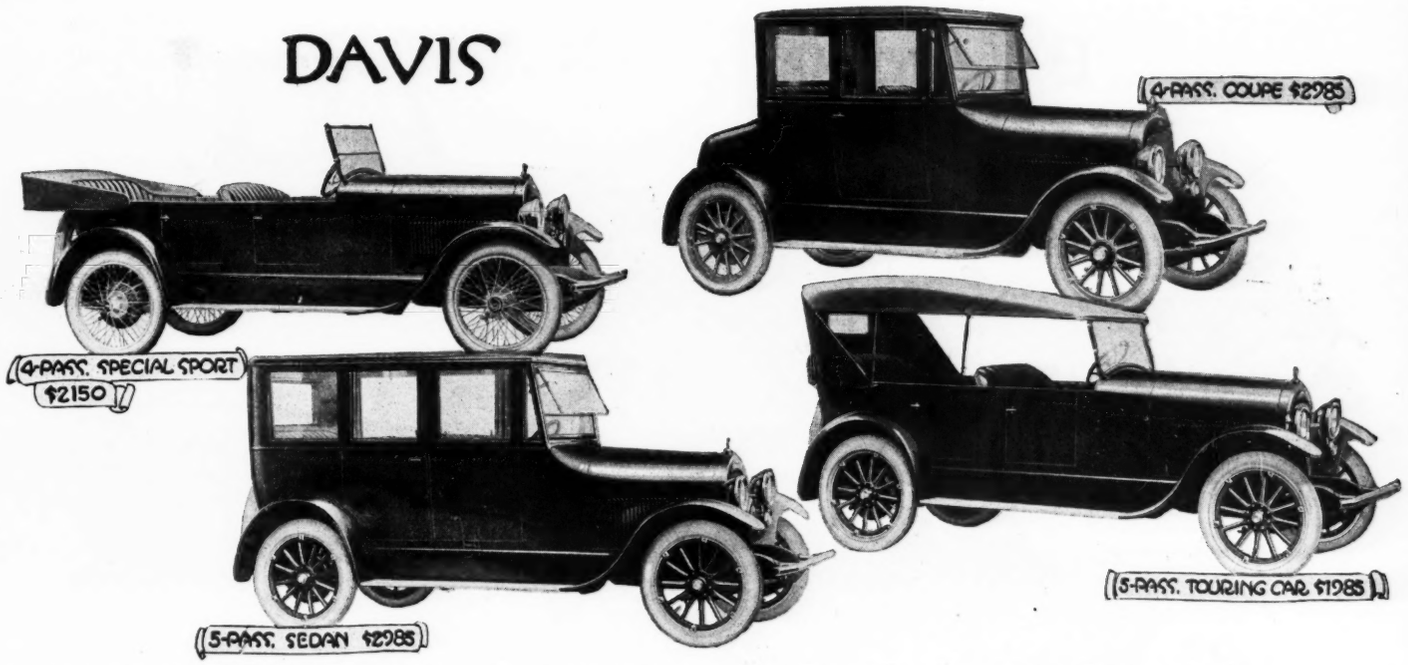
FOUR body types are offered on the Dodge Brothers standard chassis model which has a wheelbase of 114 in. and is fitted with a four-cylinder engine of 3⅞ by 4½ in. bore and stroke. These are a five passenger touring car, two passenger roadster, five passenger sedan and a three passenger coupe. The engine is the company's own make as are also other units. The Stewart carbureter and North East electric system are employed.

DORT



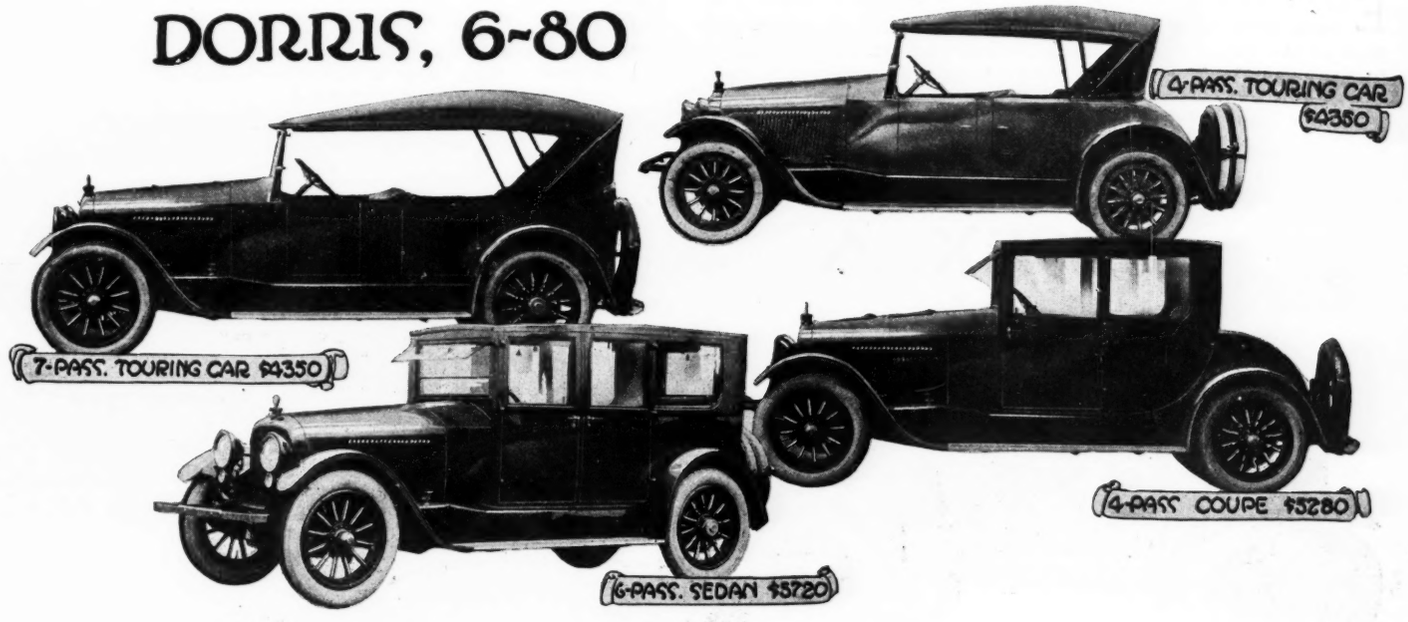
THE chassis of this car is virtually the same as for 1919 with a few minor refinements but in the main it remains the same. Four body types are offered, a five passenger touring, two passenger roadster, five passenger sedan and three passenger coupe. This car has a wheelbase of 105½ in. and is fitted with a four-cylinder Dort-Lycoming engine that has a bore and stroke of 3½ by 5 in. Carter carbureter, Mechanics' gearset, Westinghouse starting and lighting and Connecticut ignition.

DAVIS



ONLY one chassis is being built this year by the George W. Davis Motor Car Co. with five body styles mounted on it. The bodies comprise a five passenger touring, four passenger sport, four passenger special sport, five passenger sedan and four passenger coupe type. Few changes other than in refinement have been made in the car this year. The Davis is a 120 in. wheelbase job with Hotchkiss drive, Timken axles and bearings, a Continental 7R six-cylinder engine of 3¼ by 4½ in. bore and stroke. The car is equipped with Delco lighting, starting and ignition and a Stromberg carbureter.

DORRIS, 6-80

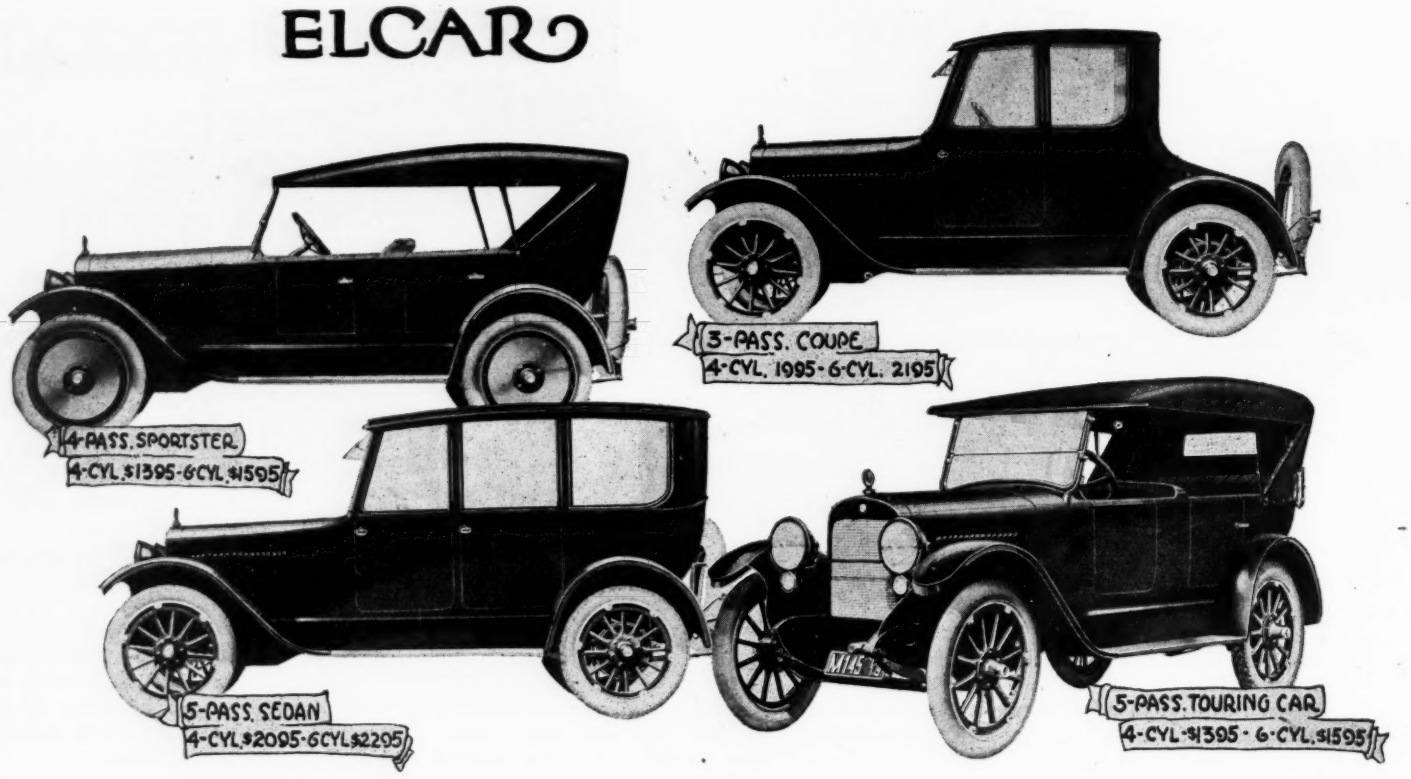


VERY few changes have been made in the 1920 Dorris. The question of handling heavier fuels has been given, though, and the two center exhausts have been cast integral with the intake manifold, producing what the company terms a super heater for the incoming gas. In addition a stove is used for heating the air going to carbureter. The use of hot air is controlled on the instrument board. Another refinement is found on the springs. The front end of the rear springs is so arranged that by loosening a small bolt the spring bolt can be turned to take up all side play. The bolt is accessible through a small opening in the splasher, making it very easy to get at the job without getting under the car. The stanchions on the windshield are very wide at the base to eliminate spring or fore and aft sway. The stanchions are nickel marine bronze and have the appearance of nickel-plate.

ECONOMY

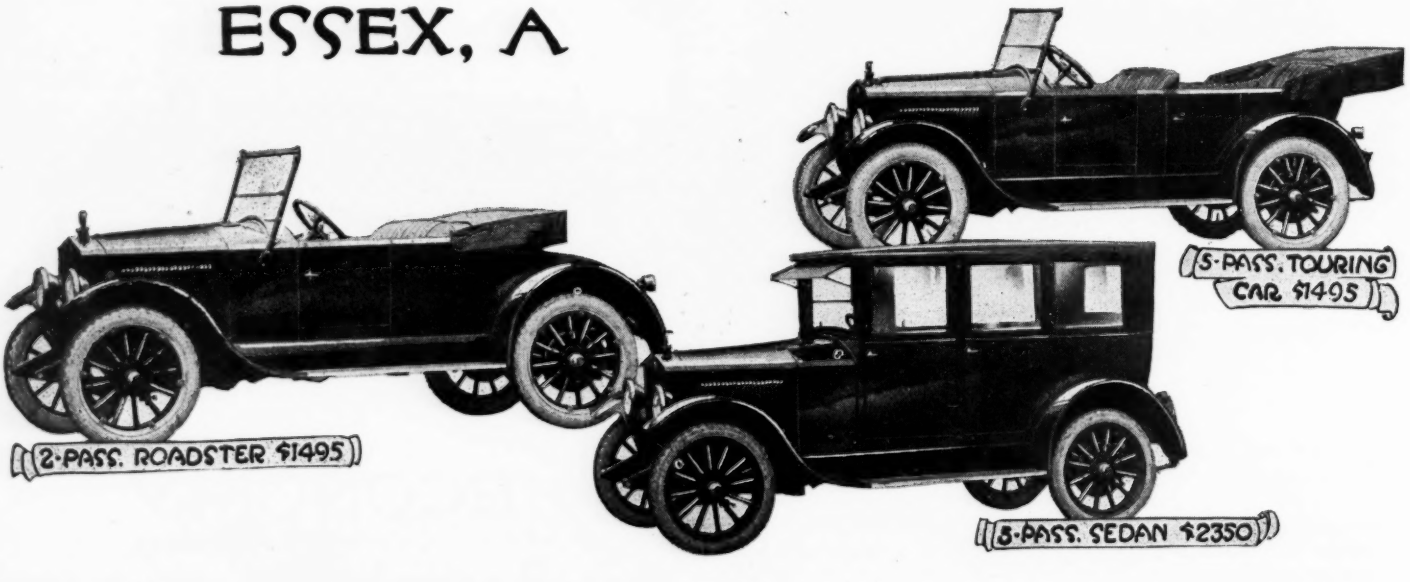
FOUR body styles are offered this year by the Economy Motor Co., Tiffin, Ohio. The line comprises a five passenger touring car, five passenger roadster, three passenger coupe and a sedan touring model. All bodies are of stream line design with double cowl and are upholstered in heavy black dull leather. Unit power plant is used with a 7-W Continental six-cylinder engine of 3¼ by 4½ in. bore and stroke. Connecticut ignition, Borg & Beck dry plate clutch, Auto-Lite electric system and floating type rear axle are used. The car has a wheelbase of 115 in. and uses 33 by 4 in. tires.

ELCAR



ELCAR continues to offer four-cylinder and six-cylinder jobs each with four body designs. These bodies fit either the four or the six-cylinder chassis because the frame is the same in each case with a wheelbase of 116 in. The six is a Continental engine and the four a Lycoming. Standard units are employed in each chassis with differences in the make used. For instance, both four and six uses a Stromberg carbureter, Borg & Beck clutch, Muncie gearset, etc.

ESSEX, A



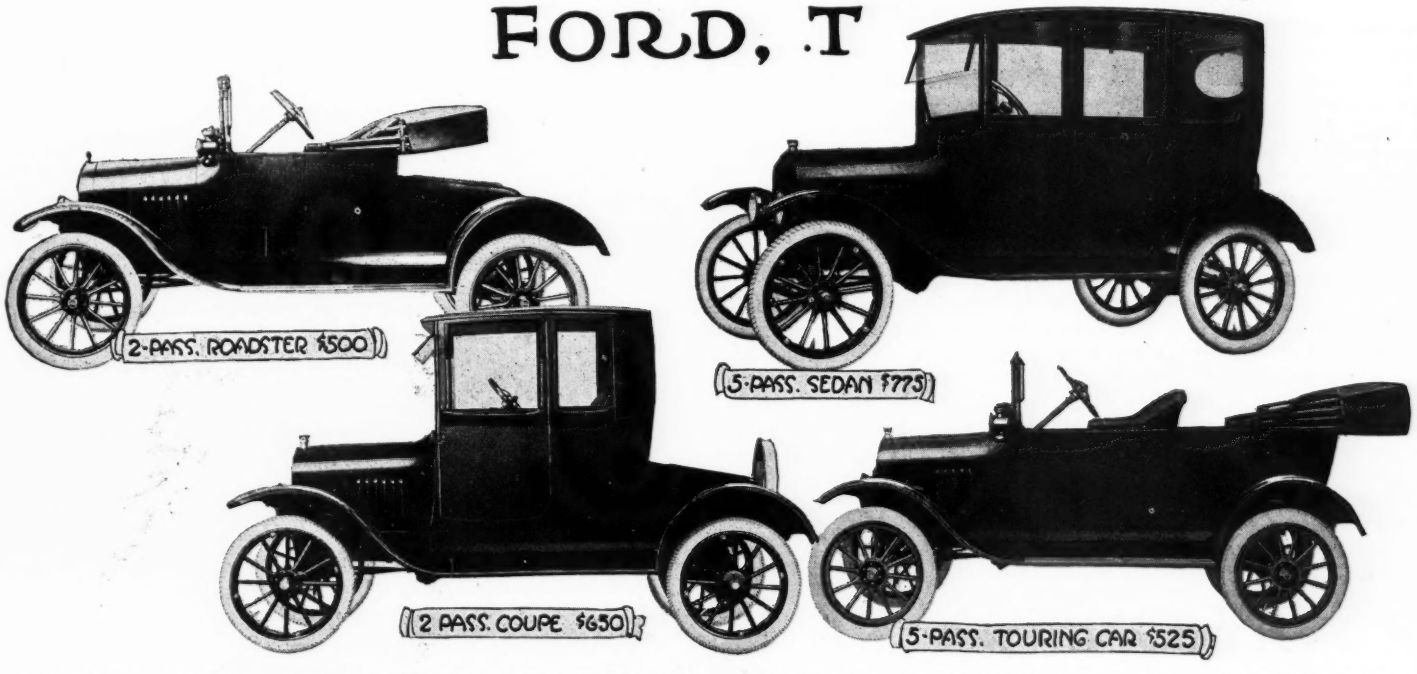
ESSEX continues its 1919 models without any changes. The engine is four-cylinder with 3⅜ by 5 in. bore and stroke, with the intake valves in the head and exhaust valves in the side. The total length overall is about 29 in. and the N. A. C. C. rating of horsepower is 18.2 while the actual horsepower developed is more than 50. The crankshaft is of special design, scientifically counter-balanced, giving static and running balance at all speeds. It has three heavy bearings. The carbureter is of heavy patented design, automatically controlled by the engine. The clutch is of the multiple disk type with cork inserts and runs in oil. The frame is a new design, strengthened at front and rear by tubular cross members and is 6 in. deep at points of greatest stress, thus insuring absolute rigidity. Special attention has been paid to the spring suspension. All springs are of the semi-elliptic type; the front being 36 in. and the rear 54 in. long. The radiator shutter insures control of engine temperature and is operated manually from the dash. The body is roomy with ample leg room and has wide doors and seat.

ELGIN, K



THE most important change in the 1920 Elgin is the adoption of the Columbia front and rear axles. The rear axle incorporates a one-piece housing, the driving torque being taken through a torque arm of seamless steel tubing. Another change is in the substitution of a 10-in. Borg & Beck clutch for the 8-in. type previously used. The axles and clutch are the only chassis changes, and those in the bodies consist of refinements only. The Elgin line now includes a five-passenger touring, four-passenger sport model and five-passenger sedan. The touring car is finished in dark blue, black fenders and natural finish wheels, while the sport job is bright red, the wheels being of the disk type.

FORD, T



AS IN the past the Ford line for 1920 takes in a touring car, roadster, coupe and sedan, with no changes, excepting in that on the coupe and sedan an electric lighting and starting system is installed with instrument board, etc. In addition these models are fitted with demountable rims and an extra tire carrier. An extra charge of $75 is made for the starting and lighting system and $21 for the rims and tire carrier. The body design remains the same.

FERRIS



THE six-passenger Ferris is a 130-in. wheelbase job with an aluminum custom built body. Five Disteel wheels are included in the equipment with a spare carted on the left side. The engine is a Continental 3¾ by 5¼ in. with Splitdorf magneto and Zenith carbureter. The rear axle is a floating type and the clutch Borg and Beck. A two-unit Leece-Neville starting and lighting system is used. A volt and ammeter is placed on the instrument board, and the system can be checked by merely pressing a button. Burnt out fuses are said to be impossible because of a special type of circuit breaker.

Springs are semi-elliptic with oilless bushings. Tires are 32 by 4½ in. cords. The six-passenger car utilizes two auxiliary seats in the tonneau and the top is lined throughout with beveled plate glass windows in the rear. It is very complete, including such features as a windshield cleaner, integral bumper with frame, trunk rack, etc.

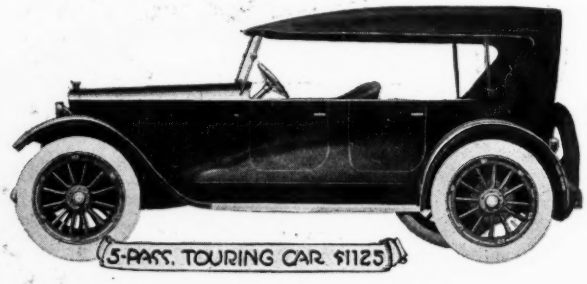
FRANKLIN, 9-B



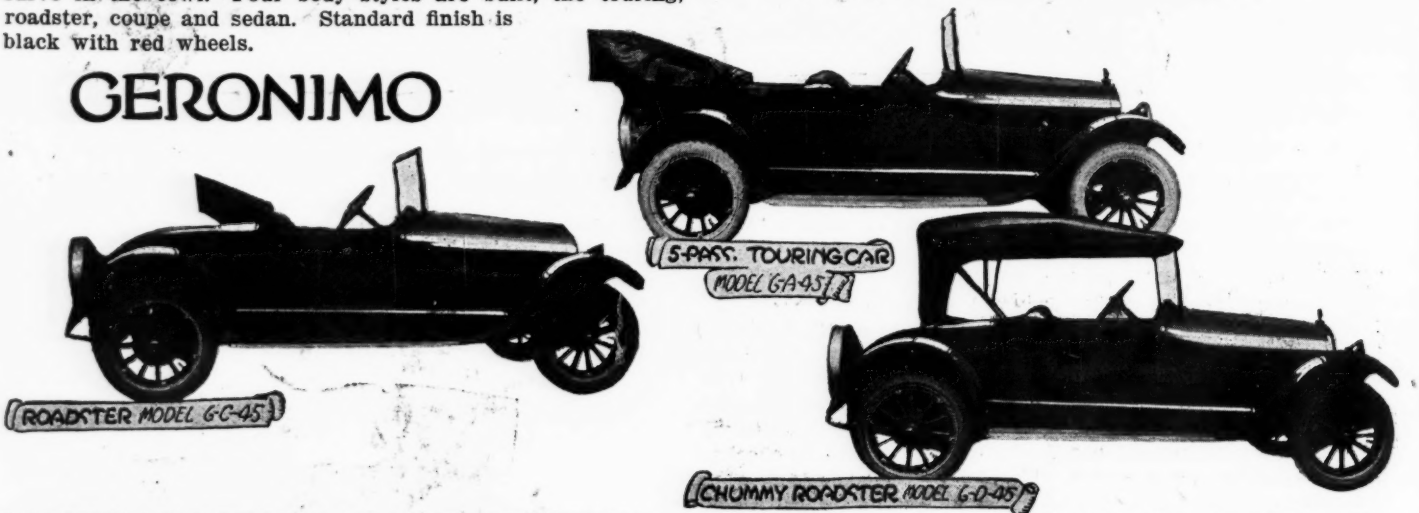
THIS chassis is continued without change. It has a wheelbase of 115 in. and is fitted with a six-cylinder engine with 3¼ by 4 in. bore and stroke. Five instead of six body types are offered this year, these being the five passenger touring, two passenger roadster, four passenger roadster, four passenger brougham and five passenger sedan, the seven passenger limousine having been discontinued. The air-cooled engine is continued, of course.

GARDNER

THE Gardner is a newcomer for this year and comes in a 112 in. wheelbase job with 32 by 3½ in. tires. The engine is a four-cylinder L-head with a bore and stroke of 3½ in. by 5 in. The transmission is a three-speed and the clutch is a Borg & Beck. The rear axle is full floating and semi-elliptic springs are used. The Westinghouse starting and lighting system is used and wood wheels are furnished as regular equipment. The body is designed along straight lines, with a slight curve in the cowl. Four body styles are built, the touring, roadster, coupe and sedan. Standard finish is black with red wheels.

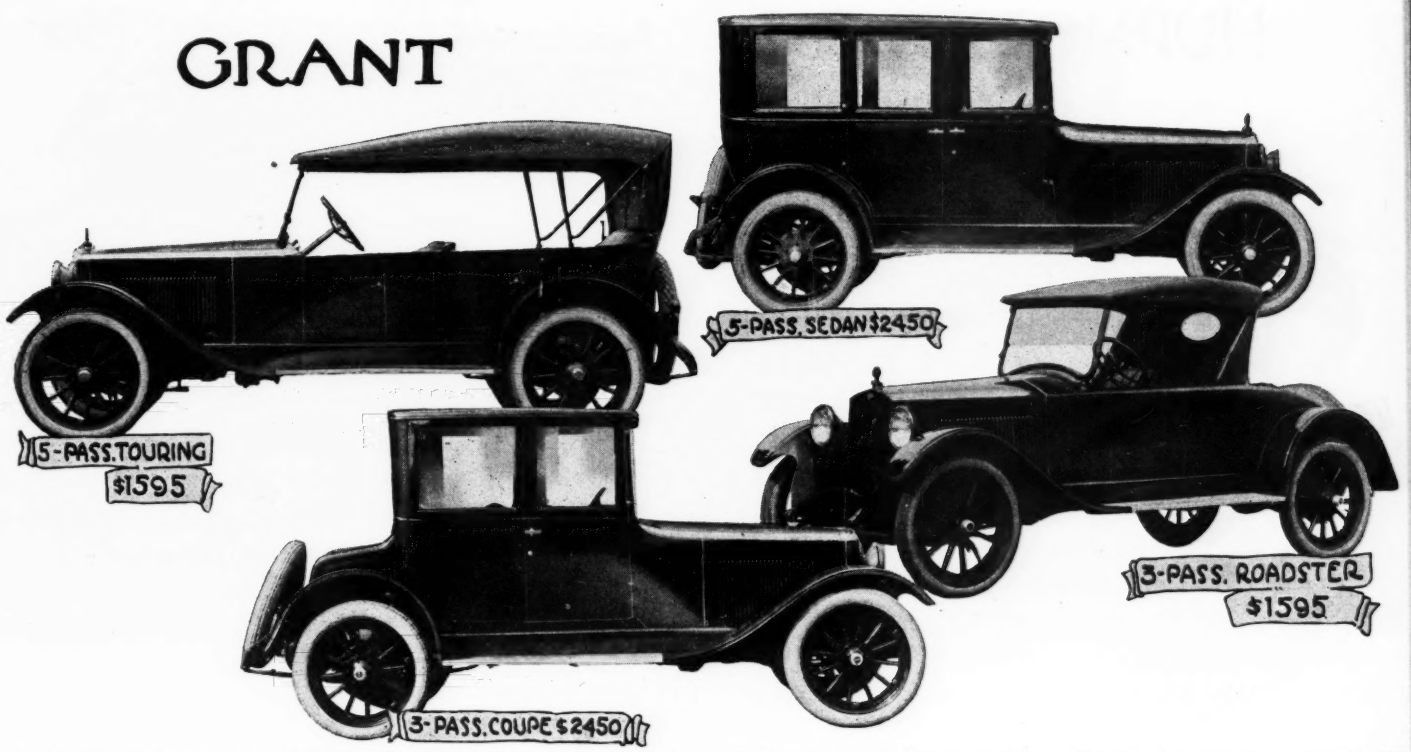


GERONIMO



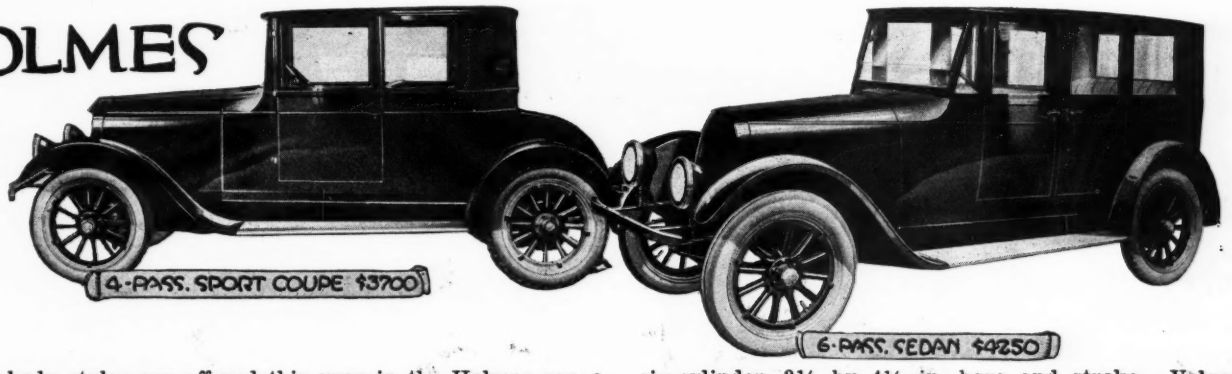
NO particular changes have been made in the Geronimo for 1920. The model this year is offered in only two body styles, a speedster and a roadster. The speedster body is a comfortable, large and roomy five-passenger body and since the addition by the company last year of its own body building plant, many refinements have been added. The wheelbase remains at 122 in. The engine is a Rutenber six-cylinder with a bore and stroke of 3⅛ by 5 in. Stromberg carbureter is used, Borg & Beck clutch, Flint Motor Axle Co.'s rear axle, Delco lighting and ignition, Willard storage battery and Stewart vacuum system. The company contemplates the addition of a new model in about two months.

GRANT



GRANT engineers completely redesigned their car for this year and numerous important changes are noted in the 1920 models. The principal changes which have been made consist in a Hotchkiss drive through 57¼ by 2 in. rear springs; deepening of the frame section with heavy strangling at front to permit of short turning radius; running boards carried directly underneath side of the frame to reduce rattle and trouble with fitting splashers; reducing of height of frame to 22 in. above the ground; elimination of long third member on the axle and the use of stamped steel axle housing made by the Columbia Axle Co. The new engine has been worked out by the Grant engineers in conjunction with engineers of the H. J. Walker Co. and its principal changes over last year are 2¼ in. crankshaft as against 1⅞ in. last year; extremely light cast iron pistons with lower center on the piston ring; gear pump instead of plunger pump; rocker arms entirely enclosed and lubricated by means of pressure feed line from pump; increased size of valves and improvement of hot-spot manifold; increased size of piping for thermo-syphon cooling; S. A. E. standard bell housing in connection with 10 in. Borg & Beck clutch; Atwater-Kent hand advance ignition system; Bijur starting and lighting outfit round nose tappets of about the same design as in previous Grant models. A size larger Jacox steering gear has been adopted.

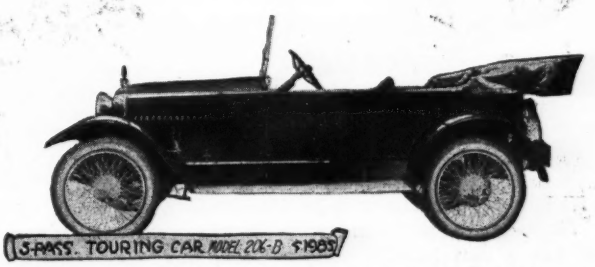
HOLMES



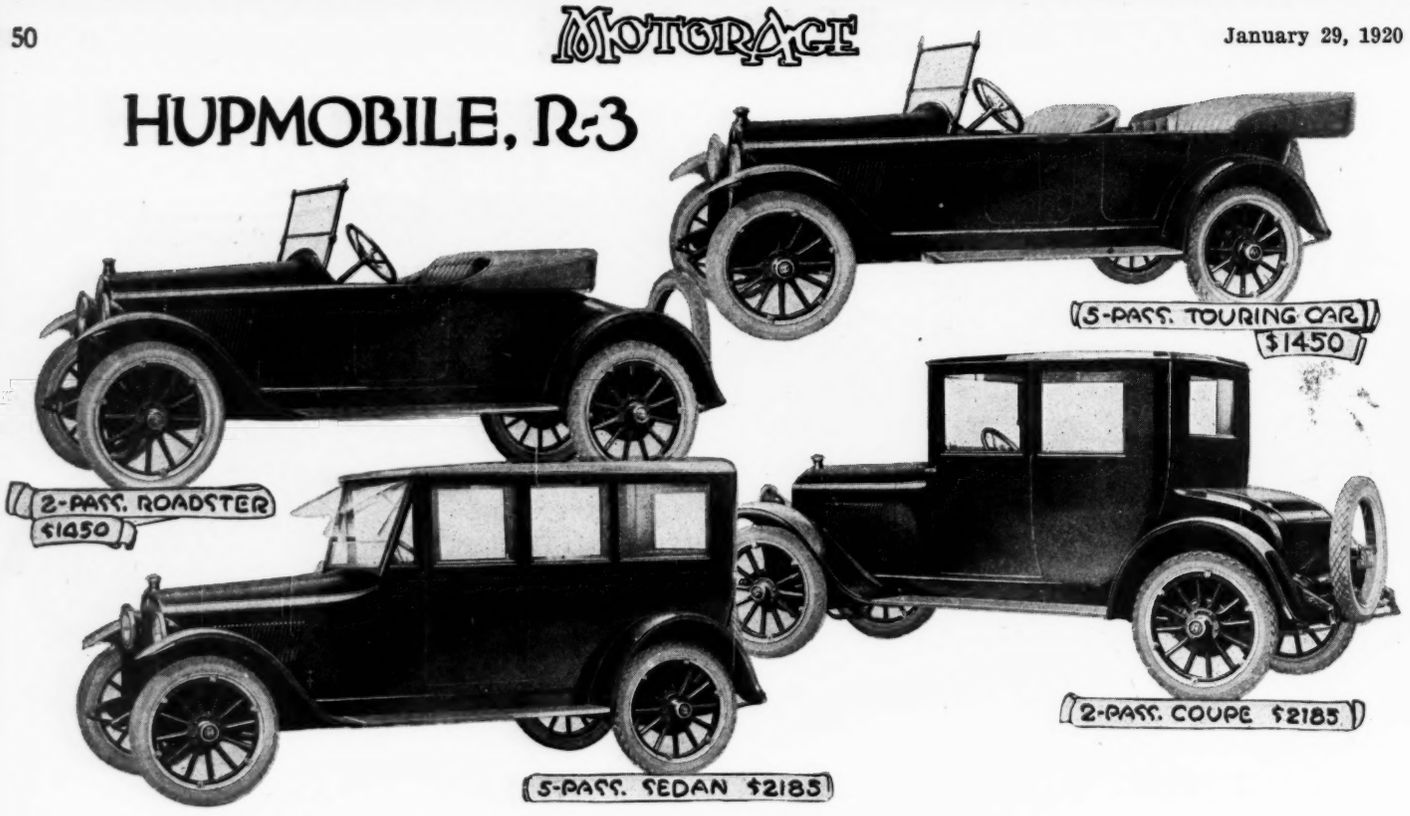
FOUR body styles are offered this year in the Holmes car, a seven-passenger touring, six-passenger sedan, four-passenger roadster and four-passenger coupe. The hood is somewhat nearer the conventional style, with a rather high but slanting front and air openings, with hinges at the dash. The engine is six-cylinder, 3½ by 4¼ in. bore and stroke. Valves are in the removable dome-shaped cylinder head with dual exhaust valves. A Newcomb carbureter, vacuum feed, Eisemann magneto with automatic advance and Dyneto single-unit electric system are among the features.

HOLLIER, 206-B

THE Hollier six for 1920 has retained the same straight line body design and nickeled radiator which featured the 1919 models. As an added feature, the wheelbase has been increased to 120 in. which enables the company to design a body 6 in. longer than last year. The result is greatly increased comfort in the driver's seat and tonneau. A further development has been the installation of a slightly heavier transmission and clutch which, aside from being less subject to wear than a lighter type, greatly improves the running qualities of the car. The new model is available in either Rolls-Royce blue, carmine or blue black.

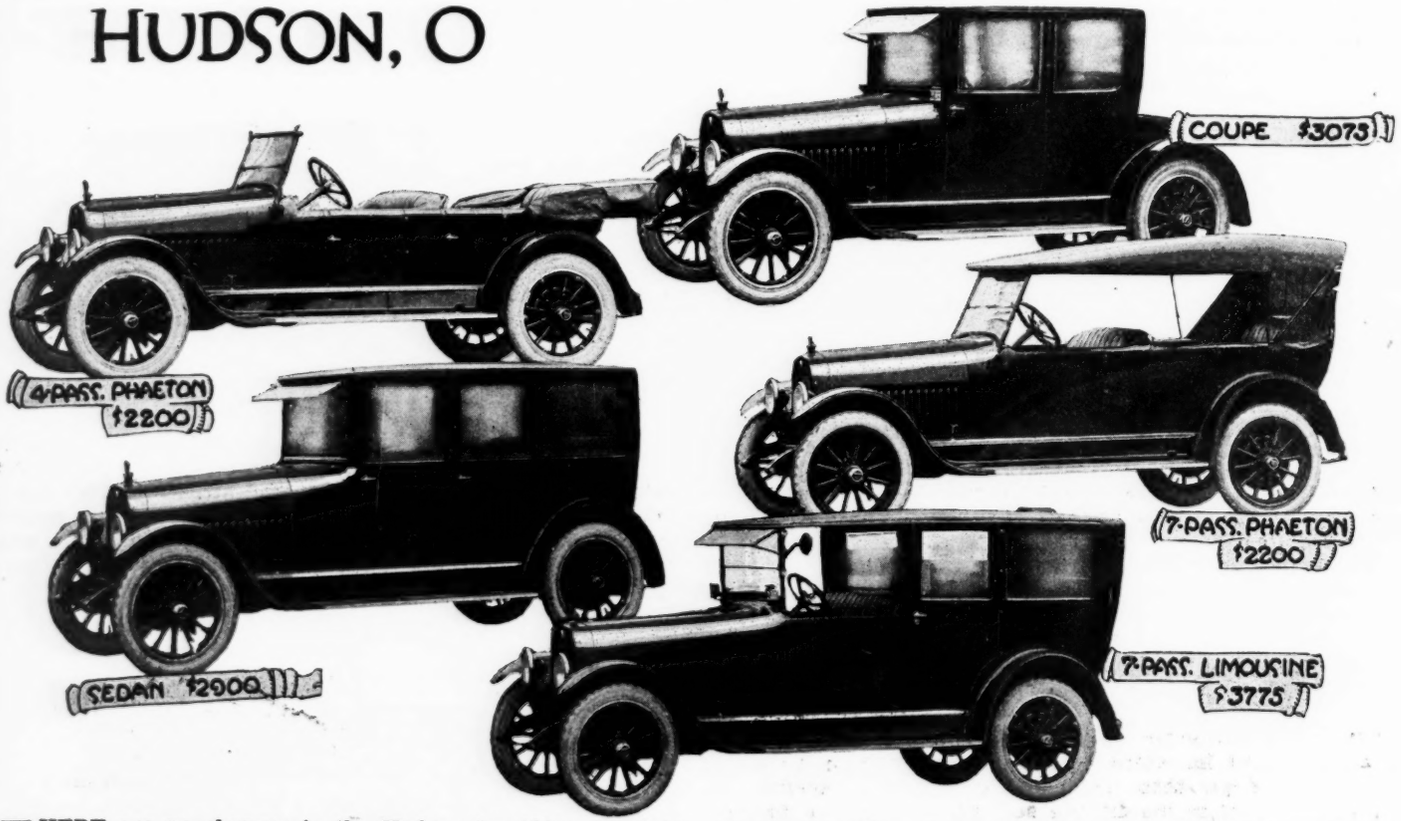


HUPMOBILE, R-3



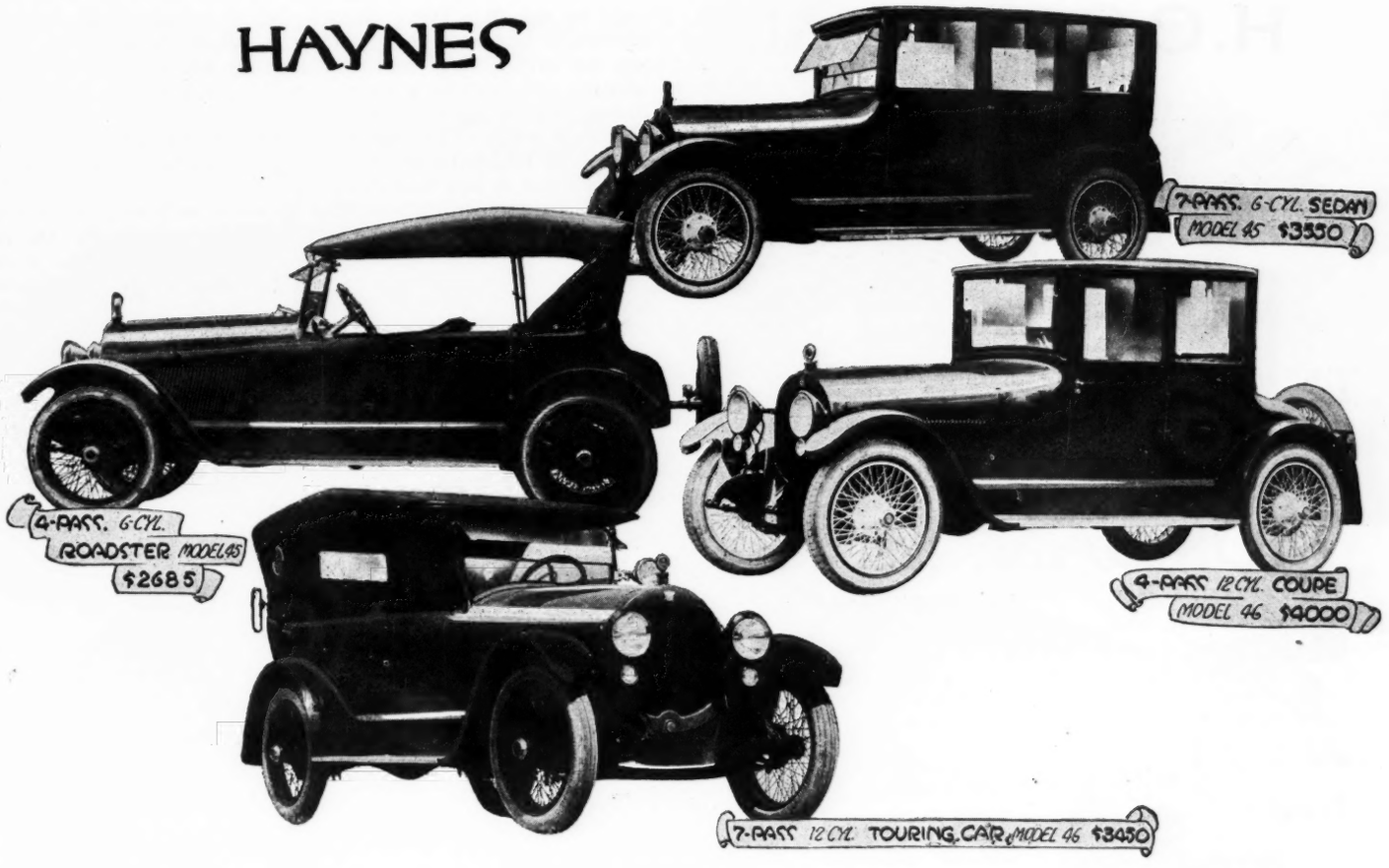
THE Hupp Motor Car Corp. has introduced a new model, the Series R, on which refinements in body and chassis design have been incorporated. The cowl has been increased in height and a larger radiator has been added. Rear fenders have been re-designed. An improved steering gear of more substantial construction has also been adopted. A rearrangement of the exhaust and intake manifold insures quick preheating of fuel and consequent increase in efficiency. The Alemite type grease cup has been generally adopted for spring shackles, spindle bolts, etc. The elimination of possible body rattles or squeaks has been aided by changes in construction of the body cowl. The headlight support and brackets are arranged so as to permit quick adjustments sideways or up and down. Comfort has been increased by the addition of 1 in. to the depth of the front seat cushion and 2 ins. to the height of the back of the front seat. Changes are general on all models.

HUDSON, O

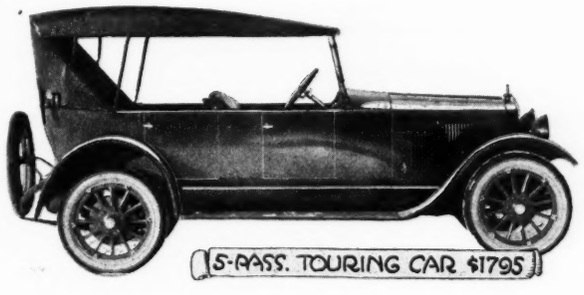


THERE are no changes in the Hudson for 1920. A slight refinement has been made in the gearshift lever which now has a ball handle, the H- gate, however, remaining the same. Body styles for this season include a seven-passenger and four-passenger open model, four-passenger coupe, seven-passenger sedan, seven-passenger limousine and seven-passenger touring-limousine. The well-known super-six engine is used and all Hudson cars have a wheelbase of 125½ in. The open models and the sedan have steel bodies, while the closed jobs are made in aluminum.

HAYNES



SEVERAL important changes are coming through on the new models of the Haynes. For one thing the wheelbase has been lengthened from 126 to 131 in. The gearshift and emergency brake levers have been brought nearer the driver and also lengthened. The muffler and muffler valve construction and operating levers have been changed so that all chasses are alike in this respect, permitting an exhaust relief valve for the open cars and this same valve is connected to a heater in the closed models. All springs will have graphite-bronze bushings with graphite bronze washers on the sides, spring bolts will be hardened and ground and will not be equipped with oil or grease cups. All springs will have less camber, which brings the frame approximately 1½ in. lower. The radiator is ¾ in. higher. The bodies are roomier. Regarding engine changes a pressure feed has been put on the dash instead of under the hood and a larger hot air stove will be used on the exhaust manifold. The electric system has been changed from double to single wire system, with starting motor switch of the magnetic type, and is on the instrument board. The battery has been moved from under the front seat to under the front floor boards. The rear axle uses gears of a coarser pitch, and the brakes are 16 in. diameter in place of the former 14 in. brakes. There are two new closed models, the five-passenger brougham and seven-passenger suburban.



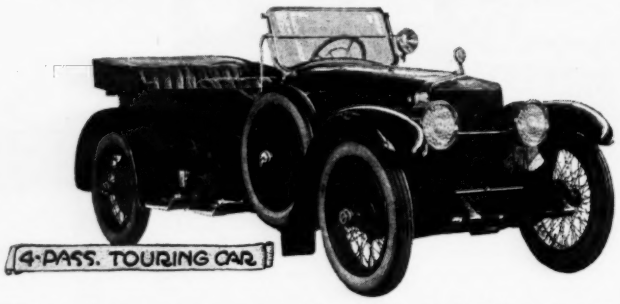
HUFFMAN, W

THE Huffman is a newcomer this year, being the first passenger car produced by the company. One chassis model is built equipped with three different body styles, a touring car, roadster and Sedan. The chassis is assembled. Included in the makeup are a six-cylinder Continental engine, Covert transmission, Borg and Beck clutch, Thermoid-Hardy universal joints, and Salisbury axles. The car will be on the market in about a month.

HATFIELD

THE Hatfield line for 1920 remains practically unchanged. The car will be produced with 115 in. wheelbase, 32 by 4 tires and powered with a 4-cylinder Herschel Spillman engine of 3¾ in. bore and 5 in. stroke. Cooling is by the thermo-syphon method and lubrication force feed to main crankshaft, camshaft and pumpshaft bearings with splash to upper and lower rod bearings and cylinders. The carbureter is a Zenith and ignition Connecticut. Other features of this car include a Borg and Beck clutch, Grant-Lees transmission, Columbia axles, Spicer universals, Dyneto starting and lighting and Willard battery. The body is a custom built job with wide doors and comes in standard body colors in green, maroon or blue.

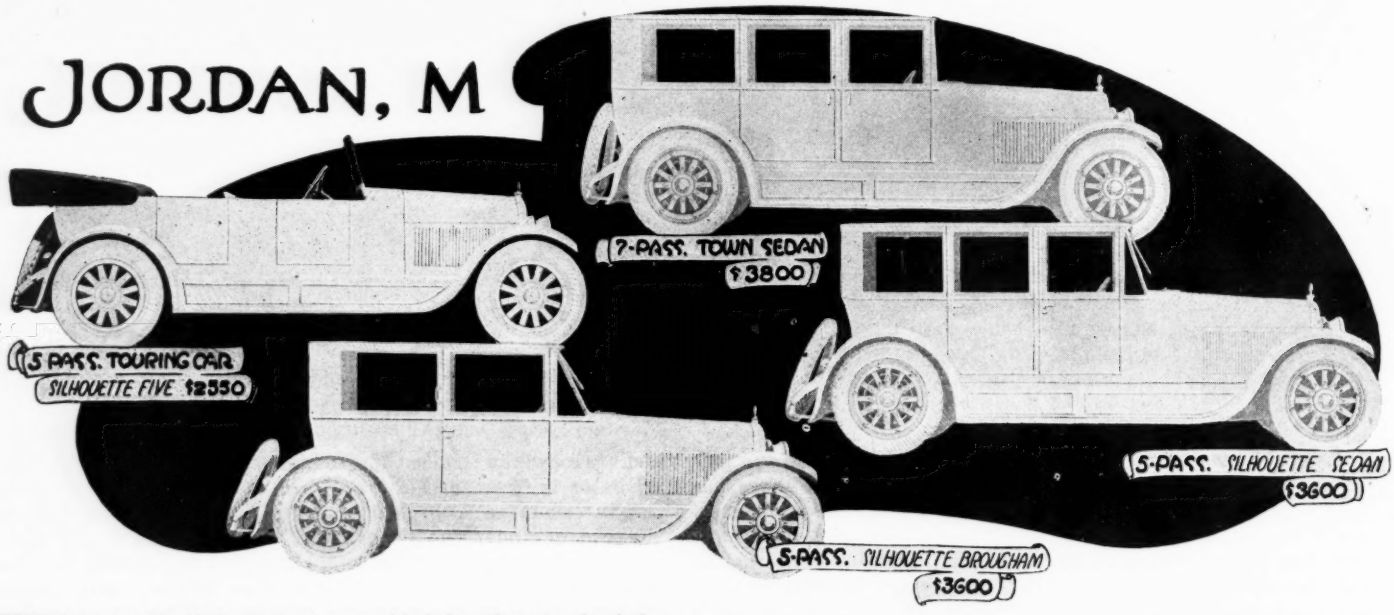
H.C.S. SPECIAL



TWO entirely new cars are shown in the lobby of the Hotel Astor, the H. C. S., designed by Harry C. Stutz and built by the H. C. S. Motor Car Co., Indianapolis, and the Ferris, built by the Ohio Motor Vehicle Co., Cleveland. The H. C. S. especially had been designed to render quick service. There are no grease cups and the starting motor, generator and ignition head has been placed on the right side of the engine in the most accessible position.

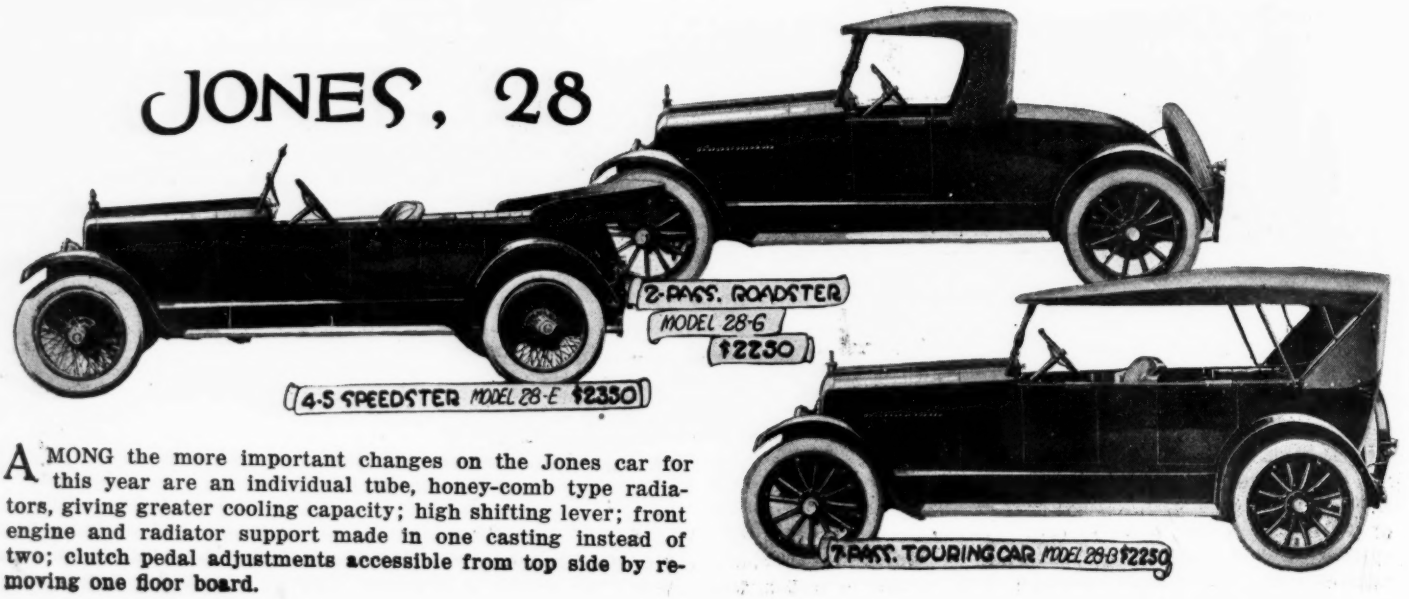
It is possible to dismantle any unit of the car, such as the rear axle, transmission, or remove the engine, steering gear, etc., without in any way disturbing the neighboring units. The car has a 120-in. wheelbase and is priced at $2950. It is powered with a Weidely four-cylinder engine of 3⅝ by 4½ in., with the valves in the head. A feature of the engine is the Lanchester vibration dampener. The electric system is three-unit Delco. Tires are 32 by 4½ in. and the car has two extra wheels and tires, one on each side. No running boards are used, two aluminum steps taking their place. The radiator is nickel plated, and a short brace is placed back of it to the engine, instead of the usual long brace running from radiator to dash.

JORDAN, M



FIVE custom-built bodies are provided for the standard Jordan chassis, which has not been changed for 1920, except for a few refinements. The line includes the Silhouette five, sedan, brougham, seven-passenger touring and the Playboy, which is built in a limited number for those who like life and action. Color and grace give this car a peculiar charm. The sedan is a new light-weight, four-door car, compact in capacity, with low hanging body and square corners. The brougham has a light aluminum body, with large window lights to afford a broad vision. The seven-passenger silhouette also uses an aluminum body and chrome vanadium springs. This car is said to be the lightest car on the road for its wheelbase. The town sedan has been discontinued.

JONES, 28



AMONG the more important changes on the Jones car for this year are an individual tube, honey-comb type radiators, giving greater cooling capacity; high shifting lever; front engine and radiator support made in one casting instead of two; clutch pedal adjustments accessible from top side by removing one floor board.

JACKSON



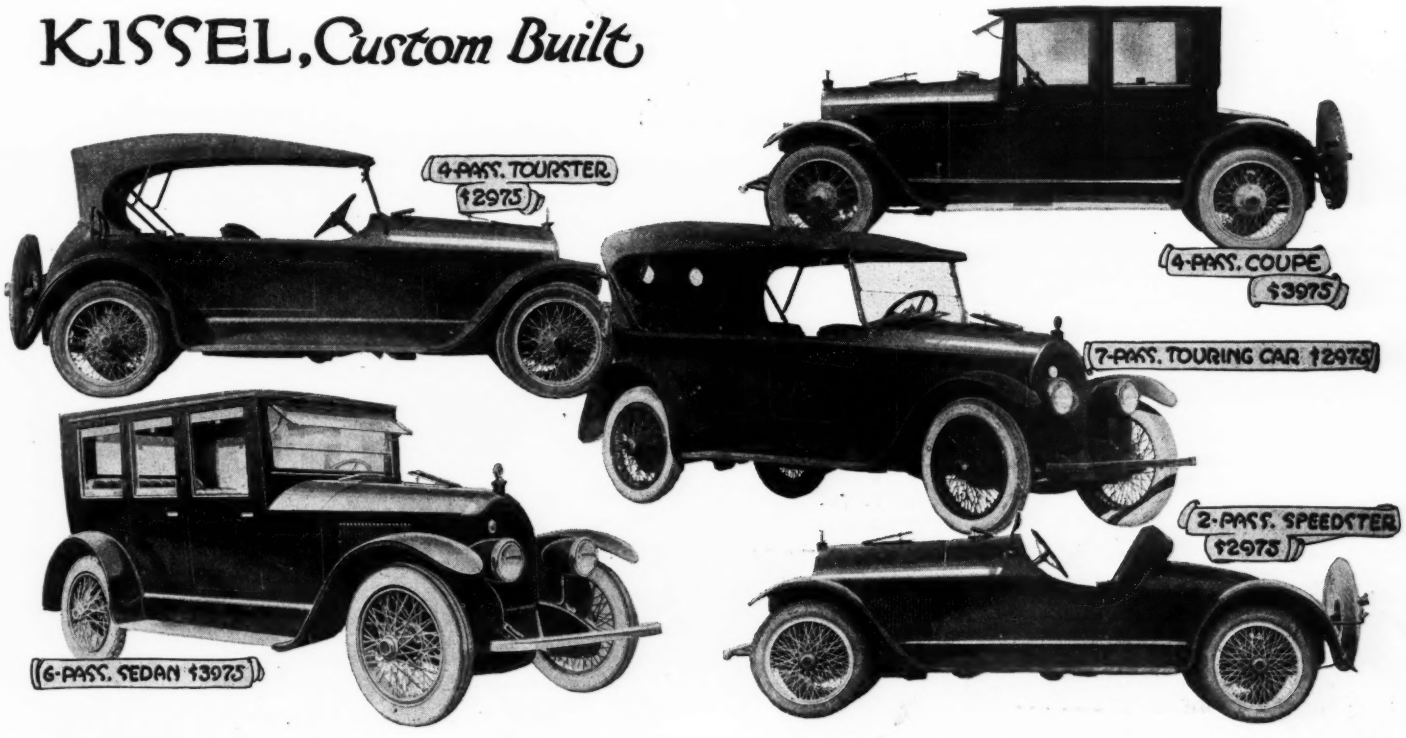
THREE types of cars are being exhibited by the Jackson Motors Corp., all on the same chassis, known as Model 6—38. These are an open touring car, a sport car and a sedan. The car that attracts the most attention at the show is the sport car, which is equipped with a California top with windows both in the sides and in the rear. This model is fitted with steel disk wheels, and with its Keystone radiator, Streamline body and Spanish leather upholstery, is of rather fetching appearance.

The Jackson is fitted with a Continental engine of 3¼ in. by 4¼ in. Fuel feed is by the Stewart vacuum system from an 18-gal. tank at the rear, where it is protected by a frame extension. There is a 1-in. Stromberg side outlet type carbureter. The Auto-Lite electric system is fitted with a switch equipped with security lock to prevent unauthorized use.

A Borg and Beck dry plate type of clutch is used, and the gearset is a Covert 3-speed and reverse, selective type. Transmission to the rear axle is through a tubular propeller shaft with two universal joints. The rear axle is a Salisbury three-quarter floating.

The emergency brake is mounted on the front universal joint, the gear-set is hand-operated, as usual. The service brake, which is foot operated, is of the contracting type and acts on 12 by 2 in. drums on the rear wheel hubs. Goodyear 33 by 4 in. tires are regular equipment on the touring and sedan models. All springs are half elliptic. The Hotchkiss drive is used. The car has a wheelbase of 121 in. Power driven tire pump is fitted.

KISSEL, *Custom Built*



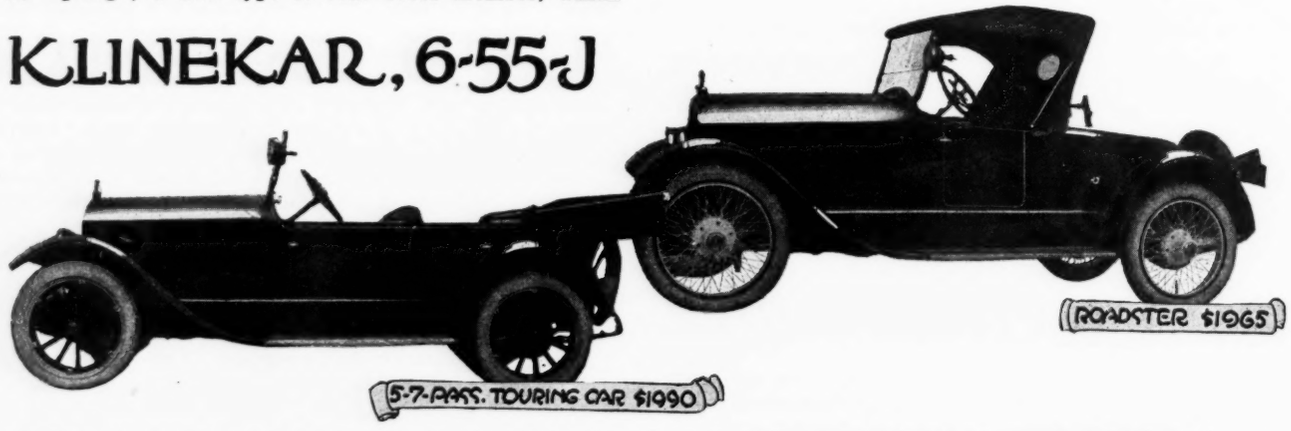
THE Kissel for 1920 will be offered in seven models, the four passenger tourster, two passenger speedster, seven passenger touring, four passenger touring, four passenger coupe, six passenger Sedan and four passenger Sedan. They are mounted on the Kissel chassis with the new Kissel engine with a bore and stroke of 5 1-16 by 5½ in. A moderate priced model is to be made incorporating the same custom built features. Features of these models are bullet-shaped headlights, a special Kissel design radiator, a long and racy hood, distinctive rounded windshield, etc. The body is a straight line type with slanting windshield. The driver's seat is arranged to slide backward and forward to obtain the desired leg room.

KING, H



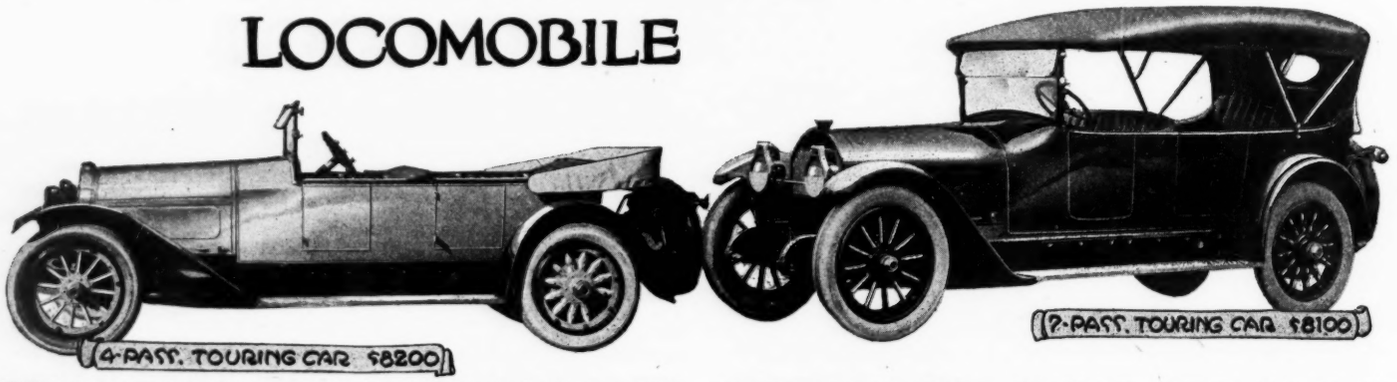
A NEW model is being offered by the King Motor Car Co. for 1920 known as the model "H." More than 100 improvements have been made in the chassis and body styles. The bodies are all new design with high hood, low sides and perfectly flat top edge. The chassis incorporates an additional cross member at the front of the frame; better and longer front and rear springs; a new type of rear cross member, which makes an extremely rigid mounting for the new tire and wheel carrier. The engine performance has been improved by lessening weight of reciprocating parts. Thirty-two in. wheels with 4½ in. cord tires are standard equipment on all four models whether wire or wood wheels. The four models are the Limoudan, touring, foursome and the Road-King.

KLINEKAR, 6-55-J



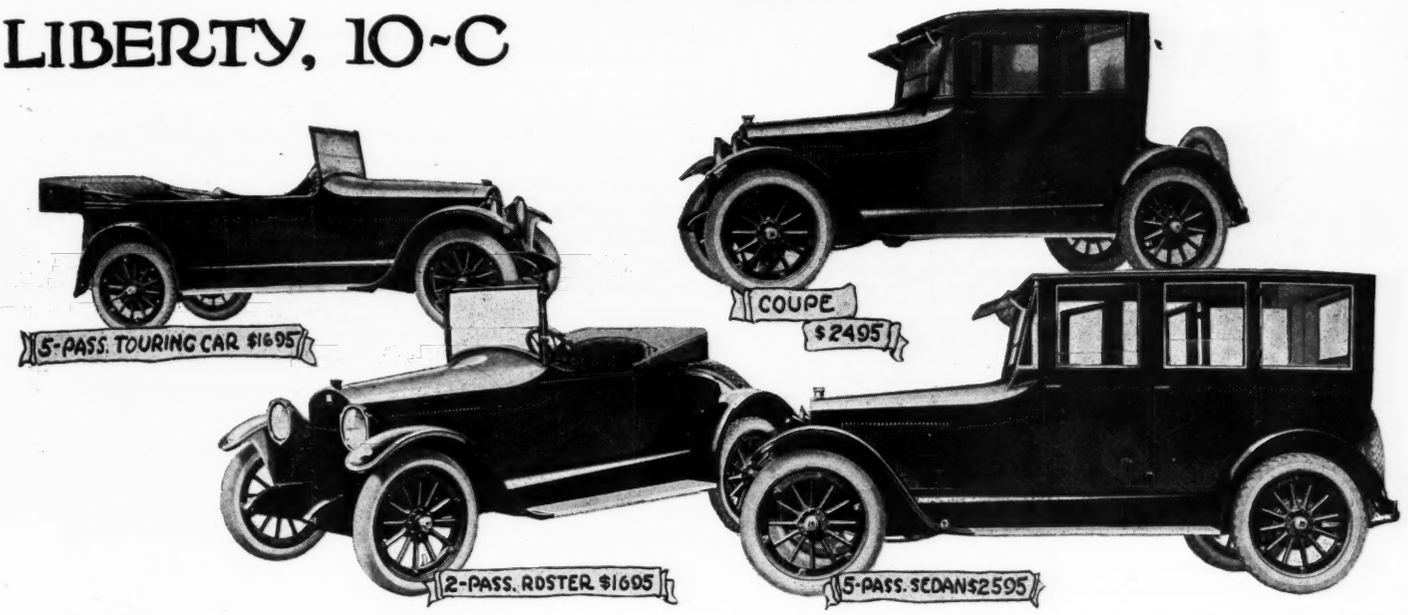
NUMEROUS changes have been made in the Klinekar this year, both mechanically and in the bodies. The engine has undergone entire change, the cylinders now being removable from the aluminum base instead of being cast integral with it, greatly facilitating service on the engine. The crankshaft has been increased 1¼ in. and four bearings now replace the former three bearings. The plunger type and oil pump is replaced with gear type force feed to the main bearing connecting rod. Four point suspension has been replaced with three point and the revolution in the engine has been increased so that the peak of horsepower is now reached at 2700 r.p.m. instead of 2200 r.p.m. The drive shaft has been replaced by flexible disjoints and tubular shaft instead of metal enclosed joints and solid shaft. The braking system has been improved by hanging levers underneath. Two-piece fenders have been replaced by one-piece crown and the front has been shortened 10 in. at the running board and the running board increase correspondingly. The bodies will continue to be custom built.

LOCOMOBILE



THE Locomobile 48 is continued with nine body types. The wheelbase is 142 in. and the car is powered with a six-cylinder engine with a bore and stroke of 4½ by 5½ in. The bodies and the chasses as a whole are a continuation of the Locomobiles of the last several years. Numerous refinements have been incorporated on the chassis, among which may be mentioned a crankshaft of greater diameter, a system of pressure oiling lubrication of chassis, an additional oil pump in front of the crankcase which prevents excessive oiling of forward cylinders when the car is running downhill.

LIBERTY, 10-C



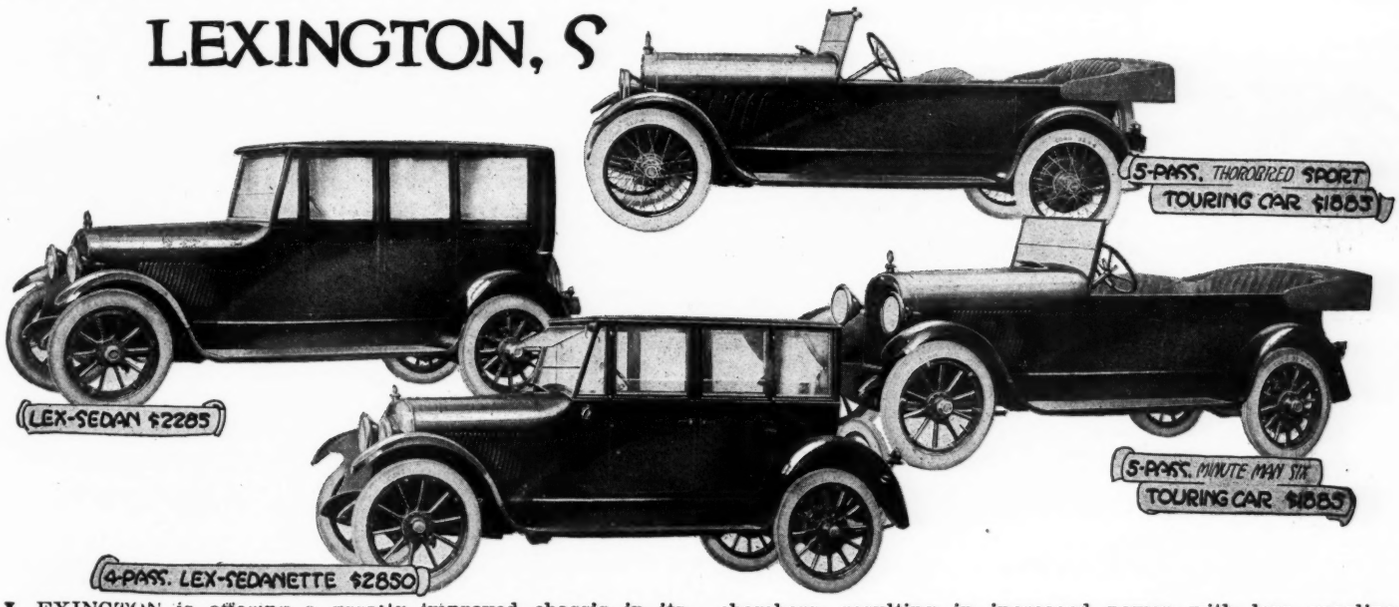
REFINEMENTS in the Liberty chassis are disclosed in the new model on the floor of the Palace. The car is 2 in. longer in wheelbase, but by a rearrangement of the engine mounting to meet the hood, it has been possible to add 4 in. to the body. The engine has been revised to some extent to give larger water jackets and a interesting change in the cylinder head divides the head casting in three in place of the single casting, which formerly covered the entire block.

The advantage of having these three cylinder heads which are interchangeable is that gaskets are saved because it is not necessary to destroy them in removing the head. Each of the small castings has an integral lip which can be utilized for tapping to loosen the head before it is removed. The smaller head is naturally inherently more rigid so that there is less likelihood of distortion in tightening the studs. Also in manufacture the stresses are not as severe on the smaller castings.

Refinements in the oiling system eliminate the splash and make the system full pressure with the oil forced through the crankshaft and fed by spray from the lower rod bearings. The oil feed control is by a vacuum system which so controls the flow of lubricant that the greatest pressure is exerted when the engine is operating under the greatest load.

The brakes are larger on this model.

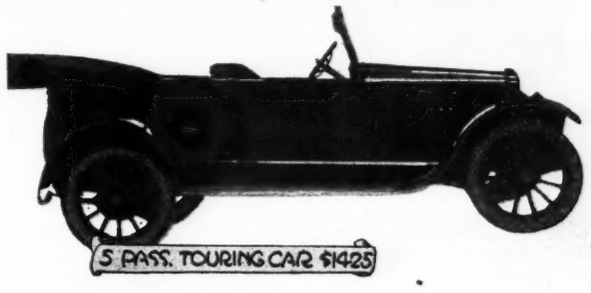
LEXINGTON, S



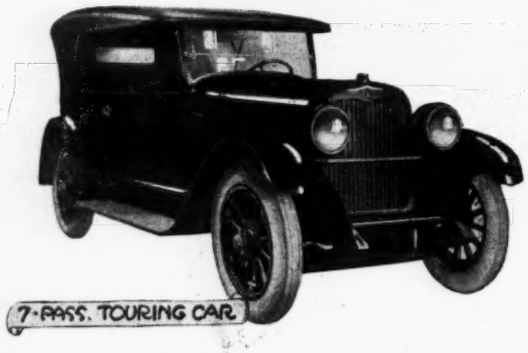
LEXINGTON is offering a greatly improved chassis in its series "S" models, current during the 1920 season. The unified frame is continued as are the emergency brake, the Moore multiple exhaust system and the self-oiling bushings. The most notable improvement is the lexi-gasifier, incorporated in the combined intake and exhaust manifold, which is said to absolutely gasify all fuel before it enters the combustion chambers, resulting in increased power with less gasoline. Another improvement is the cable foot brake which does away with roads and is perfectly equalized at all times. Five body styles are offered, a touring car, sport model, Sedan, coupe and sedanette. Cord tires are regular equipment.

LORRAINE

THIS car is a 114 in. wheelbase job with 32 by 4 tires and powered with a four-cylinder Herschell-Spillman engine of 3½ in. bore and 5 in. stroke. Other features include a Borg & Beck clutch, Grant-Lees gearset, Stanpar rear axle, Gemmer steering gear, Westinghouse electric system with U. S. L. battery.



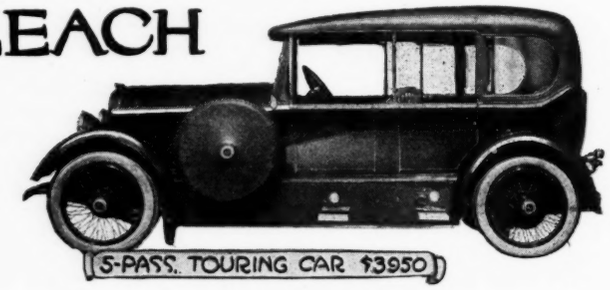
LAFAYETTE



FIVE body styles of aluminum construction on a standard 132 in. wheelbase chassis will be offered by the Lafayette Motors Company for 1920. Closed cars will predominate the line. Since designs have been approved for a limousine and 4-passenger coupe to go with the touring sedan. Open cars will be limited to a touring car and torpedo four-seater. A distinct refinement of the Lafayette touring car is the rounding upper body edge which is a departure from both the bevel and flat body edges. The driving compartment has been designed for comfort and convenience of the driver.

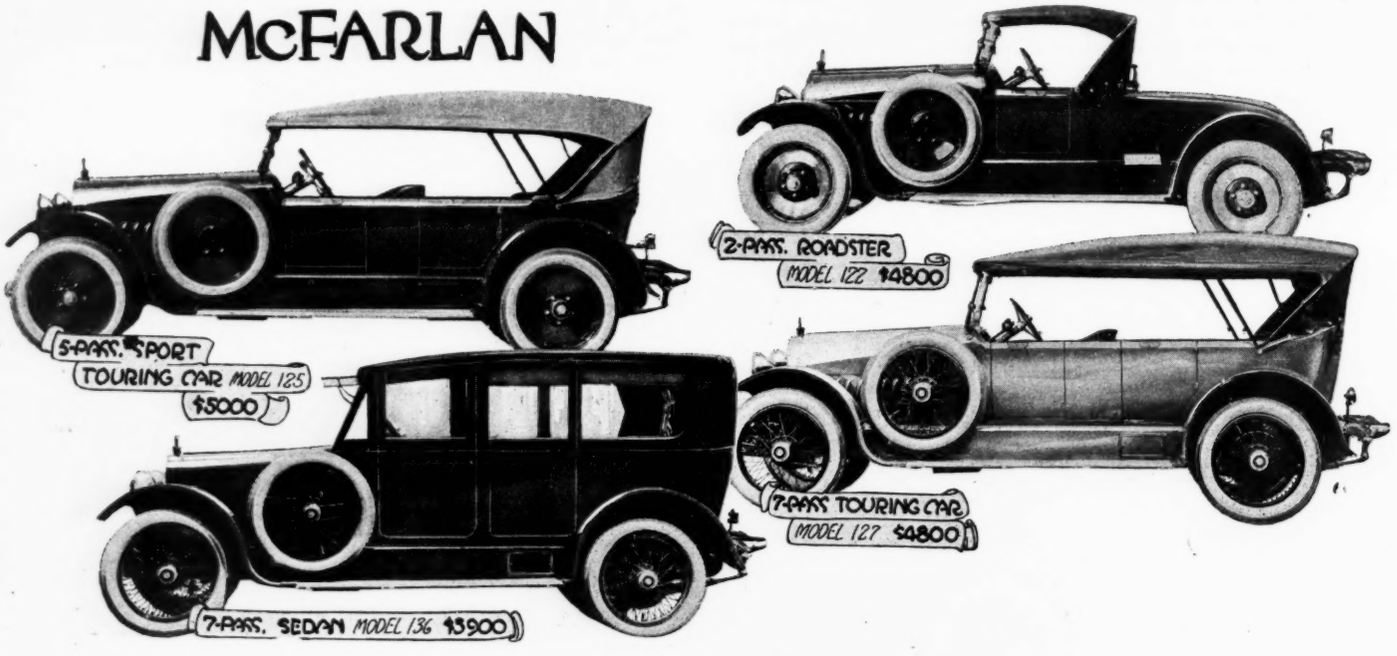
The instrument dial where speed, mileage, time, oil and gas pressure and ammeter reading are all indicated under a single oval glass is centered on the dash, with the lighting and ignition switches at the left and a cigar lighter at the right. The dash light is invisible and the steering wheel with wood spokes is a new note. Pedals are rubber covered and the button used for tilting the headlight reflectors is conveniently placed just back of the steering column. Side curtains are attached to brackets and open with the doors while a top refinement consists of the use of horizontal rods to prevent sagging.

LEACH



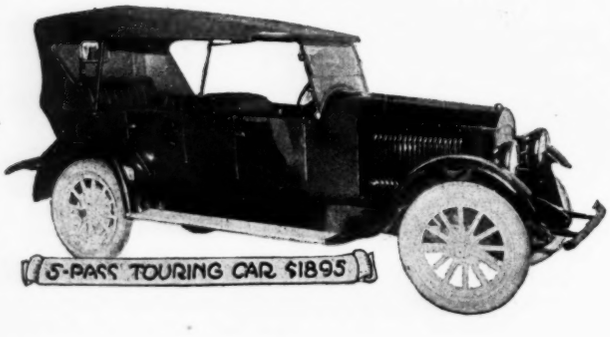
LEACH is a newcomer for 1920 and is a 126 in. wheelbase car, using a Continental engine of 3½ by 5¼ in. cylinders. The axles are Timken, starting and lighting, Delco, and the transmission a Brown-Lipe. The body line includes a seven-passenger touring and four-passenger speedster. The finish is optional. There are many innovations on the car, such as electric lights to illuminate the steps, etc. The top, body and fenders are hand-made. Side curtains which slide up or down feature this car and make it either an open or closed model.

McFARLAN



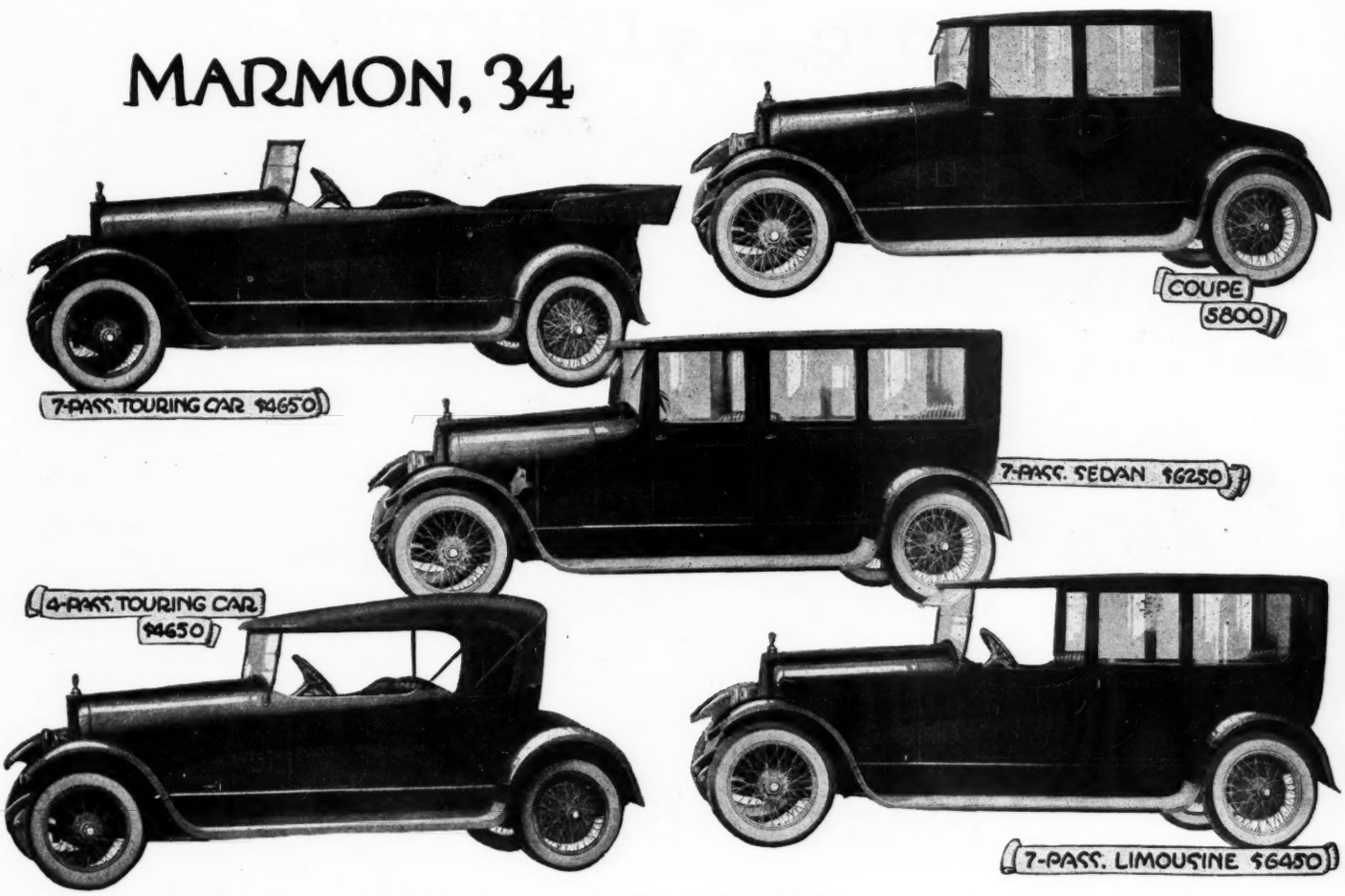
McFARLAN is producing the same chassis as last year's model. The engine, unlike that in the majority of cars, is of the T-head type, with large piston displacement. The cylinders are 4½ in. by 6 in. Both magneto and battery ignition is used. McFarlan cars always have been distinguished by high-grade body designs, the special feature of the closed jobs being the low mounting of the bodies and the extremely low overall height of the body. The sport sedan is only 76 in. overall in height.

METZ



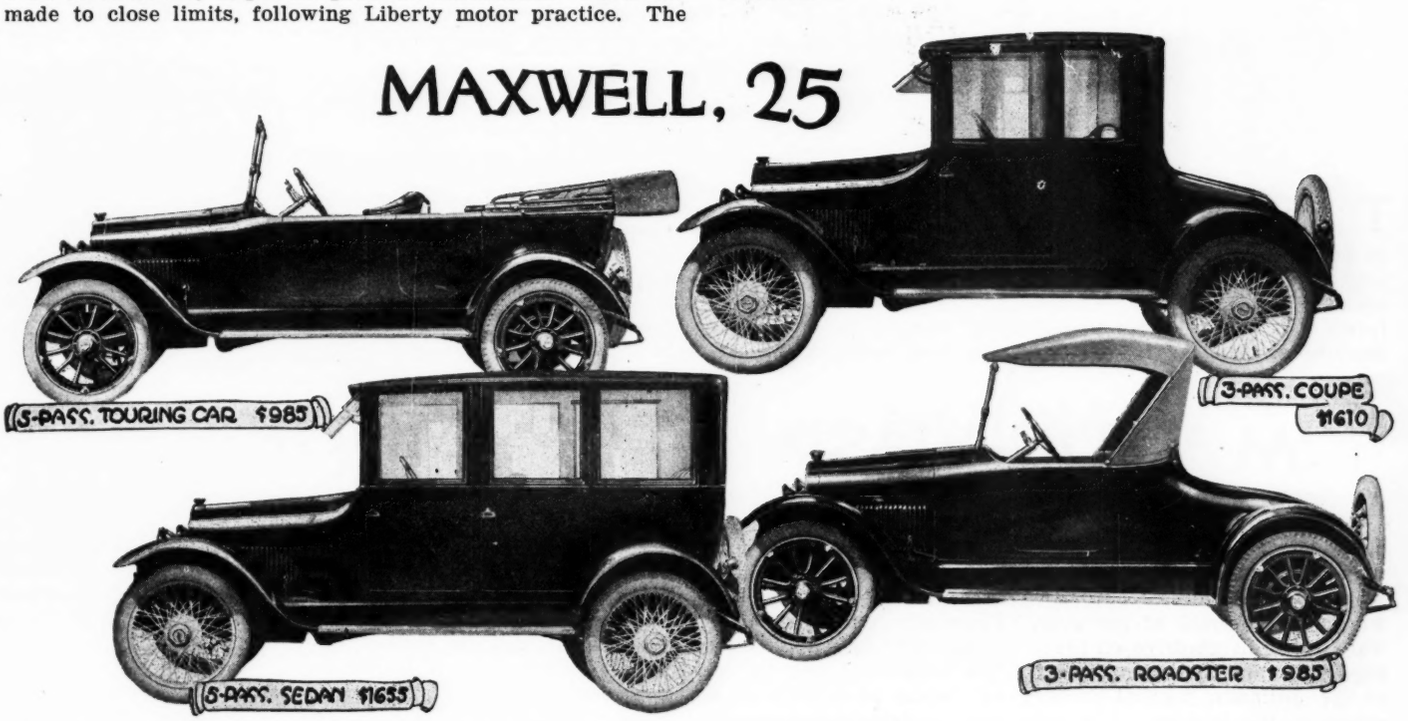
METZ will continue its present model unchanged for 1920, except for an increase in price. The car is powered with a 45 hp. engine having six cylinders, three-speed transmission, semi-floating axle, semi-elliptic springs with Hotchkiss drive. The tire size is 32 by 4 in. The car has a wheelbase of 117 in. and weighs less than 2500 lbs., it is said. The gasoline tank is at the rear with vacuum feed.

MARMON, 34



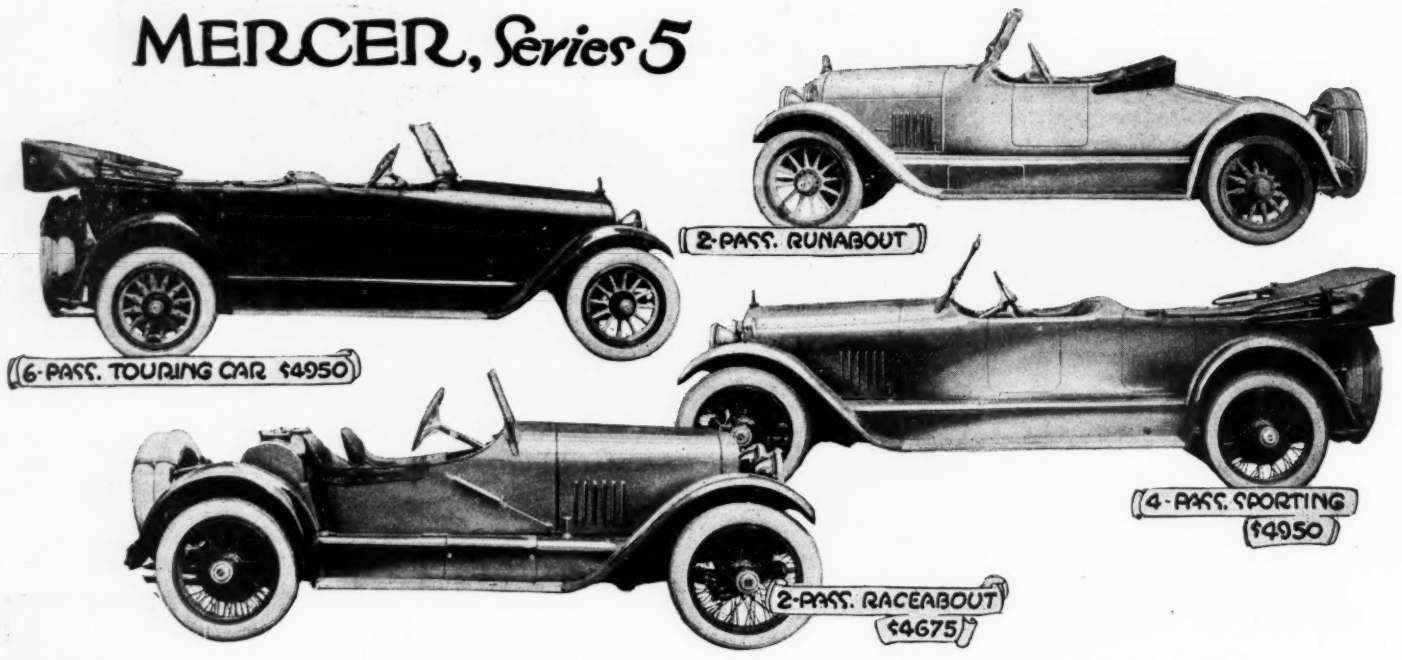
A NEW series of the Marmon 34 is being introduced at the shows. The main feature of the new car is the engine which the makers term a "high efficiency engine." The engine has such features as cast-iron backed bearings, fitted without shims; two-piece pistons of aluminum and cast-iron; crankshaft with bearings 2¾ in. in diameter; valves in the head 2 in. in diameter; improved pressure lubrication. Parts are made to close limits, following Liberty motor practice. The new car has a multiple disk dry-plate clutch. In appearance the car follows closely the lines of previous Marmon 34 models and embodies well known Marmon features such as extensive use of aluminum. Special frame and running-board construction, cross cantilever rear springs, etc. Delco starting, lighting and ignition is used. Seven body styles are furnished as standard.

MAXWELL, 25



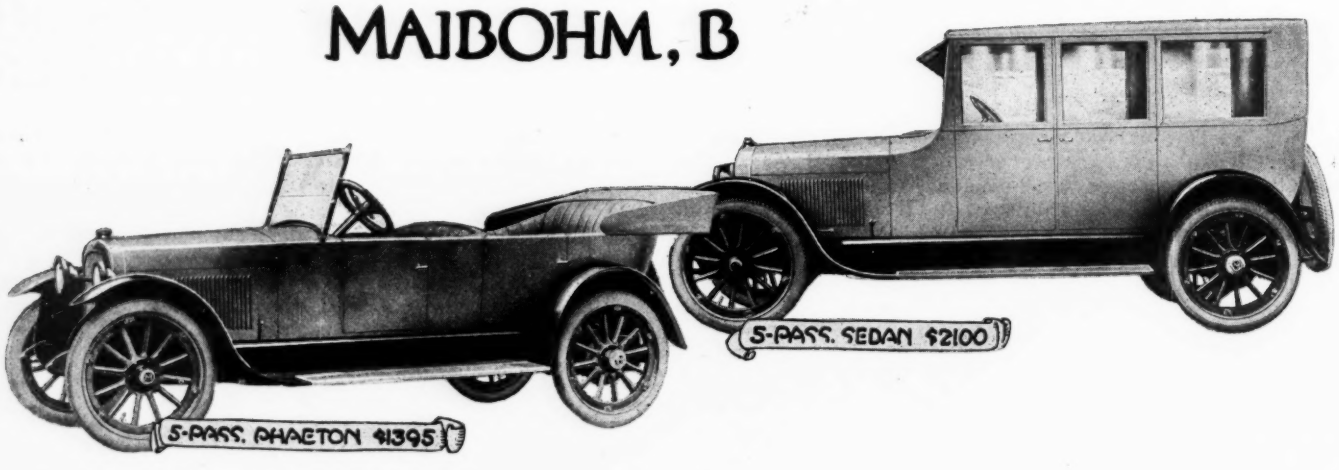
THE Maxwell 25 is continued for 1920 with four body styles. It will have a five-passenger roadster, five-passenger Sedan, three-passenger coupe and two-passenger roadster. The company has held fast to its one chassis and there have been no fundamental changes made in its mechanical construction in the last three years or more.

MERCER, Series 5



MERCER cars are continued about the same for 1920 as for the two preceding years. The same long, low and thoroughly harmonious lines of the body are retained. The series is designated as Series 4 and consists of touring, sporting, runabout, raceabout and touring limousine. Accessibility stands out all over the power plant of this car and it is a pleasure to lift the hood and view the clean exterior of the engine, which, needless to say, is very fast.

MAIBOHM, B



THERE have been several important changes in chassis and body of the 1920 Maibohm and among these are refinements in body and windshield. A radiator of Perfex make is now used and Bijur starting and lighting has replaced the former system. The top flange of the frame has been widened at the front end. The Muncie transmission now is used and the Bucyrus steering gear. A change has been made in the carbureter, a Tillotson now being used. Another important change has been made in the universal joints, Flexite joints having been substituted for the older types. A 10 in. Borg & Beck clutch is used for the former 8 in. The pedals have been made so as to allow for adjustable pads. A slight increase has been made in the overall width of the fenders, and 10 in. lamps will be used.

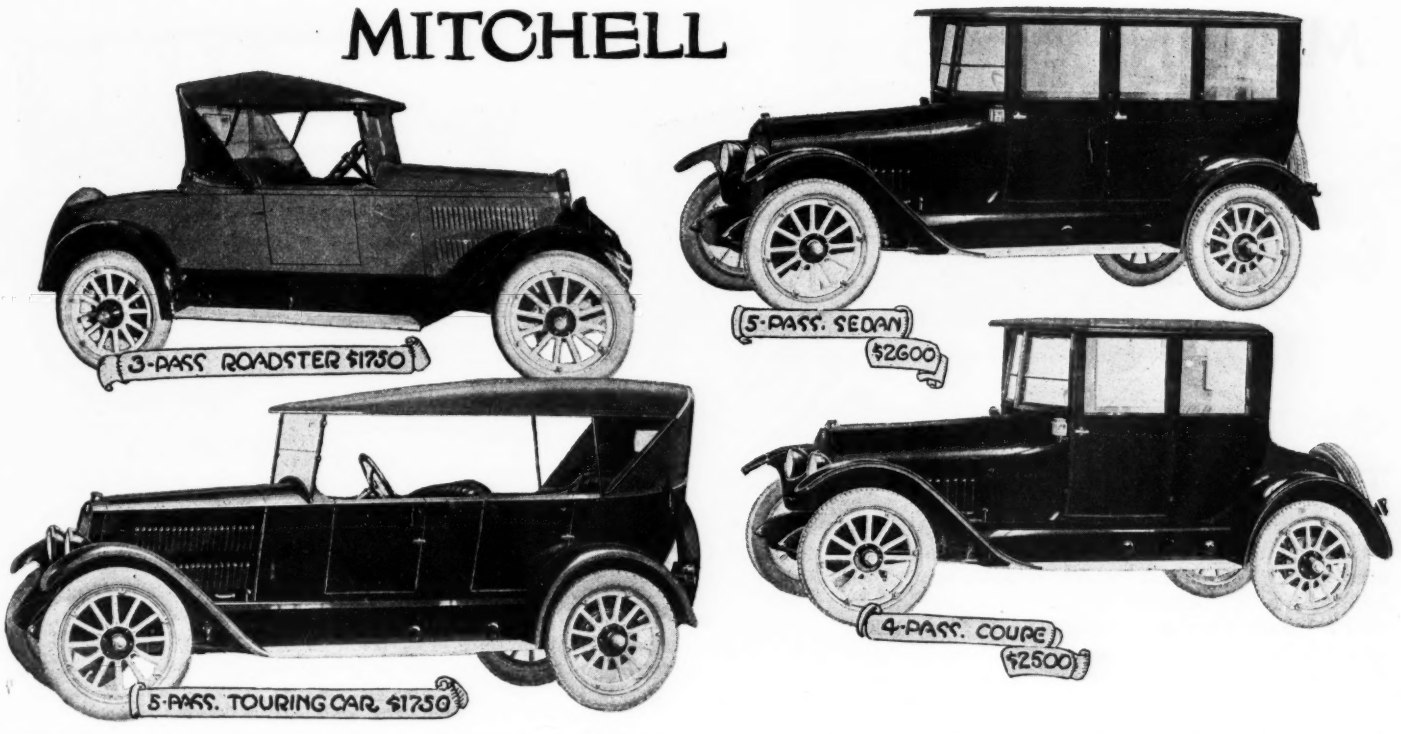
MARTIN-WASP

A NEWCOMER this year is the Martin-Wasp, a four-cylinder car with a custom built body of unusual design. It is made by the Martin-Wasp Corp., Bennington, Vermont, and uses a Wisconsin engine 4¾ in. by 5⅛ in. It has a 132-in. wheelbase and carries 33x5 cord tires. Two extra tires and wheels are carried at the rear. There are four speeds forward, with direct drive on fourth speed. The universal joints are Spicer and the axles Timken. The body work is quite out of the ordinary, natural finished ash being used to a great extent in the interior. The upholstery is detachable and the seats are placed very low. The tonneau has a slanting footboard similar to that in the driving compartment. Other features of the car include a vertical and double pane windshield.

MOORE

THE changes from last year in the Moore have been in the motive power, length of wheelbase, spring suspension, radiator capacity and wheel size. A Turner and Moore engine now is being used, a four-cylinder. The radiator is higher, allowing more cooling capacity than formerly. The wheelbase has been increased to 110 in. and tires are 32 by 3½ in. The rear springs are semi-elliptical and of unusual length and unique suspension. A Marvel carbureter is used. There are now eight louvers in the motor bonnet. The five-passenger body style is being continued with refinements. The 1920 line also includes a very attractive two-passenger roadster. The front fender also has been changed. The Levine steering gear also is being used.

MITCHELL



THE new model F-40 Mitchell shows several refinements over the Victory model of last year. One of the distinguishing features of the new car is the use of a sloping radiator and all other normally vertical lines, such as louvres, cowl, door lines, etc., smartly raked back to harmonize. Another novelty is a moulding carried underneath the bevel crown which merges into the hood. Many refinements in the chassis, such as driving the speedometer from the transmission, the use of taper roller bearings in the rear wheels, etc., are noted. Better factory methods have resulted in working to closer limits on the new car. The latter has an engine with a bore and stroke of 3¼ in. by 5 in. and the following bodies are available: Five-passenger touring, five-passenger sedan, three-passenger roadster and four-passenger coupe.

MONROE, S-9

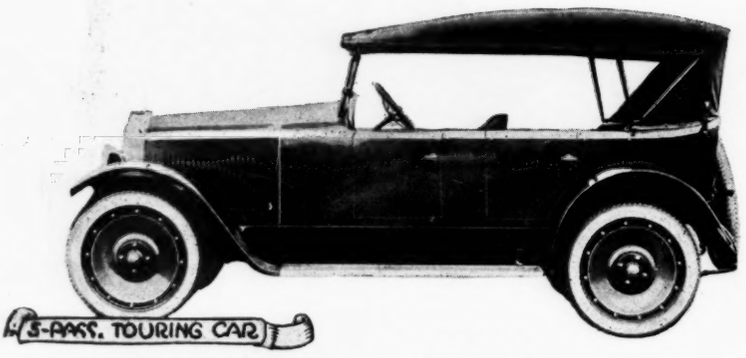


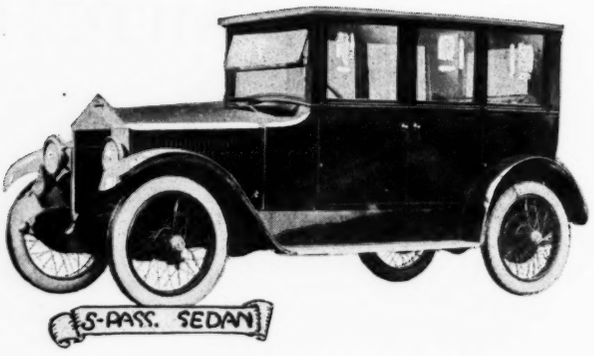
MONROE will produce for the 1920 season a four-cylinder car powered with an engine of its own make, the latter being 3¼ by 4½ in. The chassis has a 115 in. wheelbase and uses such well-known units as the Munsey clutch, Mechanics' gearset, C. A. S. steering gear, Auto-Lite starting and lighting, etc. The company makes its own rear axle. Included in the body line is a five-passenger touring car and two passenger roadster. The bodies on these cars are distinguished by the high sides with a gracefully rounded edge. The running boards are integral with the side members of the frame proper.

NORMA.

THE Norma line for 1920 will include a foursome and speedster, the former is particularly modish in appearance with battleship gray body, white wire wheels, nickeled radiators and trimmings, red, green blue, gray or black upholstery and tailored top with nickeled elbows and arms. The speedster is finished in gunmetal gray with the other items being the same as on the foursome. The chassis has 128 in. wheelbase with Timken axles, Stanpar springs, Continental Red Seal Engine, Zenith carbureter, Borg and Beck clutch, and Detroit gearset. One of the features of this car is the laminated wood construction of the body, which is an eight-ply wood with veneer finish. It is covered with aluminum.

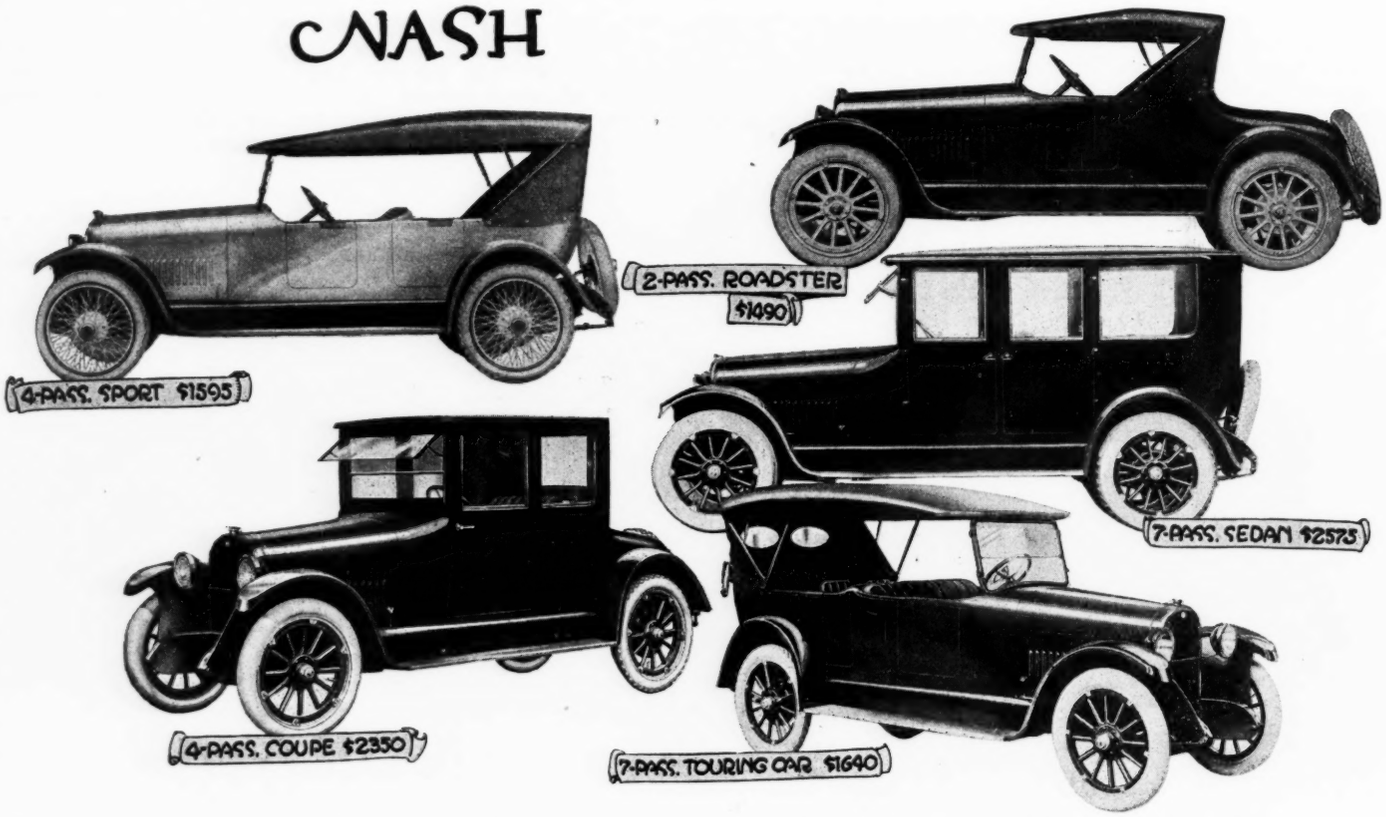
MOON, 6-48





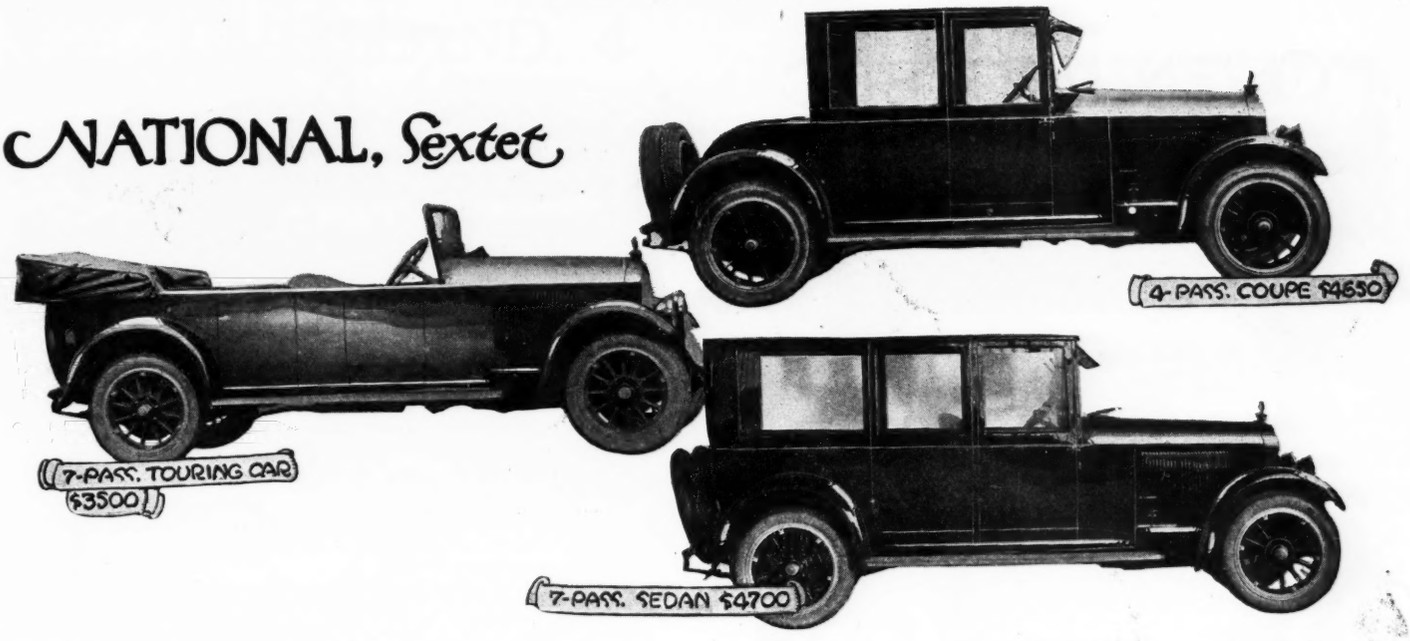
THE model 6-48 supplants the Victory model of last year and model 6-68 supplants 6-66, which has been built for the past 3 years. Both cars use the Continental engine, the 6-48 using the new 7-R, which is 3¼ by 4½ in. Model 6-68 uses model 9-N engine, which is 3½ by 5¼ in. The model 6-48 will follow closely the lines of the Victory model, but with a longer wheelbase, this being 122 in. A Stewart vacuum tank has been added in place of carrying the tank in the cowl. The units in model 6-68 are the same but larger. Both cars use Timken axles. Other changes in the 6-48 include: 16 in. brake drums in place of 14 in., adoption of Spicer joints, 6 in. frame channels in place of 4½ in., 54½ in. rear springs in place of 52½ in., adoption of Stewart speedometer and Maxim muffler. On the larger car Delco lighting, starting and ignition is used, Rayfield carbureter, together with deeper frame, etc., as on the other model. Cord tires are now furnished as regular equipment. The hood is 2 in. longer than the Victory model, and there is 2 in. more room in the driving compartment.

NASH



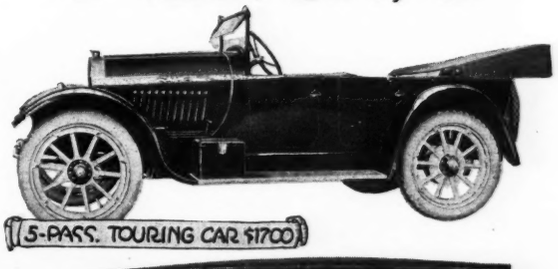
THE Nash line for 1920 except for minor refinements is the same as its predecessor. However, the center of interest around Nash production is in the direction of the new 4-cylinder car, a small brother to the present six. It is in every respect the Nash 6 only on a reduced scale. The cylinder dimensions are the same, but the wheelbase is 116 in., or 5 in. shorter than that of the six. Tires are 32 by 3½ cords. The price on this small job has not been announced, but it likely will be around $1,200. On the 6-cylinder car the changes consist of a slight alteration in the valve movement to get quiet operation, with new type of manifolding to assist in vaporizing heavier fuels. This is done by the use of hot spots at the place where the manifold enters the cylinder casting as far as possible from the carbureter. Another important engine change consists of placing the spark plugs from their former position in the cylinder block to a new position in the head on the opposite side of the engine, which makes them more accessible and shortens the high tension wires and incidentally keeps them away from the exhaust manifold heat. The emergency brake drum has been stiffened by a flange, which helps keep it concentric. This flange also prevents grease from the universal joint being thrown on the brake bands. Instead of a tungsten exhaust valve and nickel intake valve, both are now of the former material.

NATIONAL, Sextet



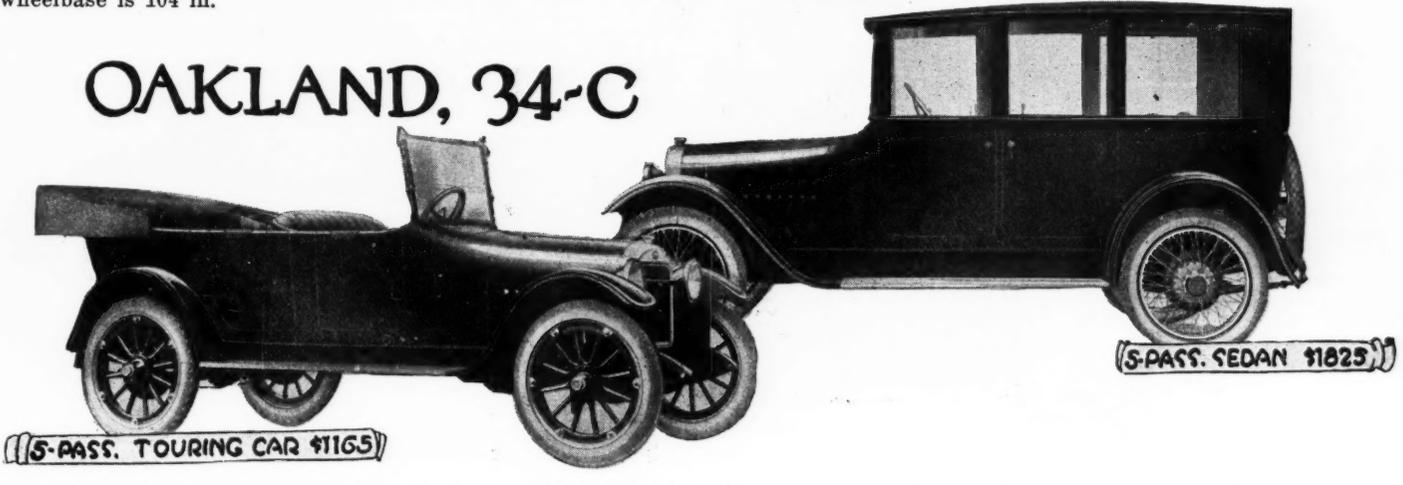
THE basic change of the 1920 National consists in the concentration on a six-cylinder overhead valve engine, the previous models having incorporated twelve and six-cylinder engines of the L-head type. One of the engine features is the lubricating system which forces oil under pressure to all points of wear, including the overhead valve mechanism. A refinement in the valves is the ease with which the push-rods can be removed without disturbing any other part. The intake manifold is cast entirely within a detachable cylinder head with a short elbow supporting the carbureter. Convenience in inspecting and adjusting the engine is found in the arrangement of the operating accessories, such as the carbureter, generator, pump, etc., all of which are grouped on the right side with a small light under the hood for light illumination. Individual front fenders which leave a gap of about 10 in. between running boards permit of easy approach to the engine. The chassis has been improved by the adoption of oilless bushings, a one-piece rear axle housing giving greater strength and lighter weight. There is a new method of body mounting whereby the latter is hung on brackets on the side channels which gives the body a drop of 3½ in.

NELSON, D



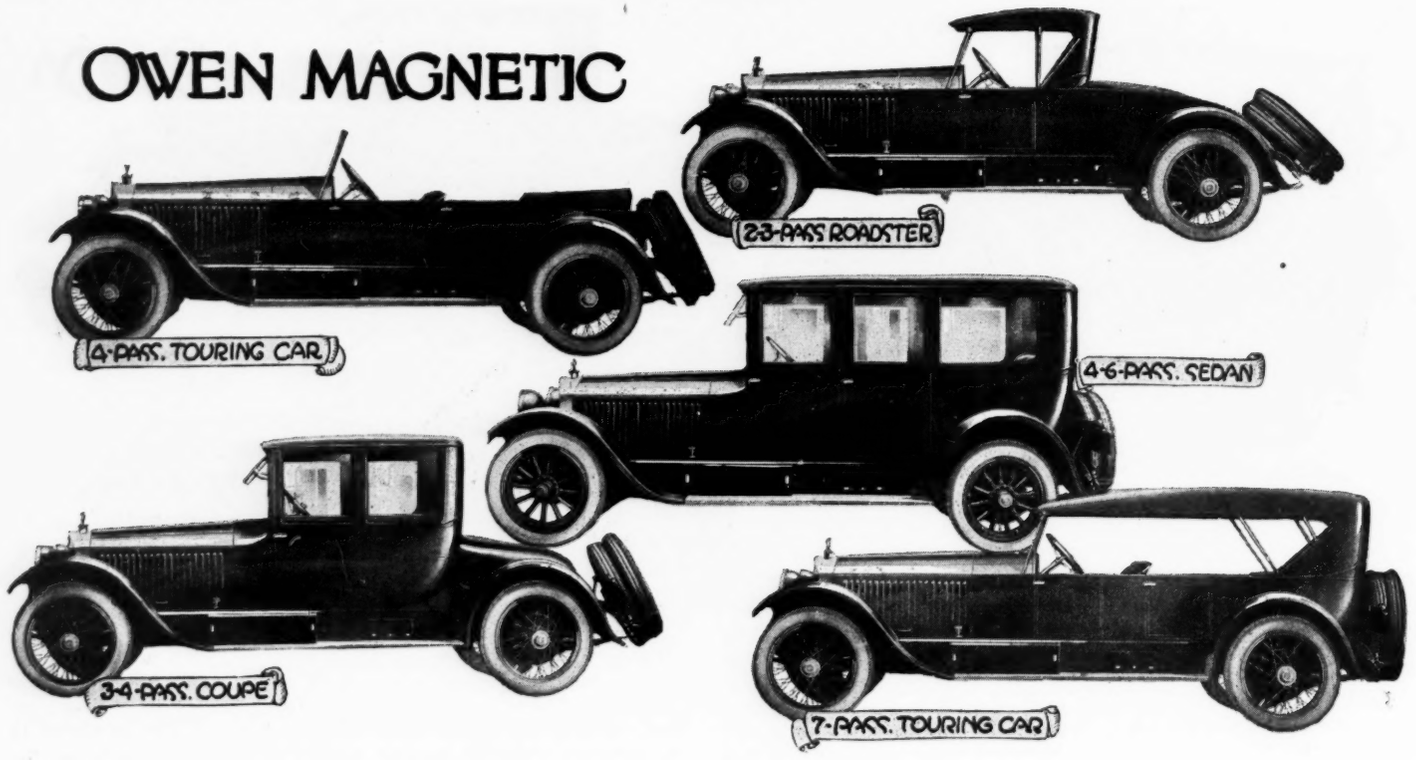
THIS car has been characterized by its many radical departures from conventional motor car design and construction. It will be continued for 1920 without change. It features a high-speed airplane type engine, with overhead valves and camshaft, Bosch magneto, Zenith carbureter, etc. An aluminum gearcase incorporates in one housing the clutch, gearset and rear axle gears, while a U. S. L. starter is mounted directly on the crankshaft. A double drop frame affords a low center of gravity to the car and brings the overall height of the body down. The springs have scroll ends, said to provide exceptional easy riding. Tires are 32 by 4 in. and the wheelbase is 104 in.

OAKLAND, 34-C



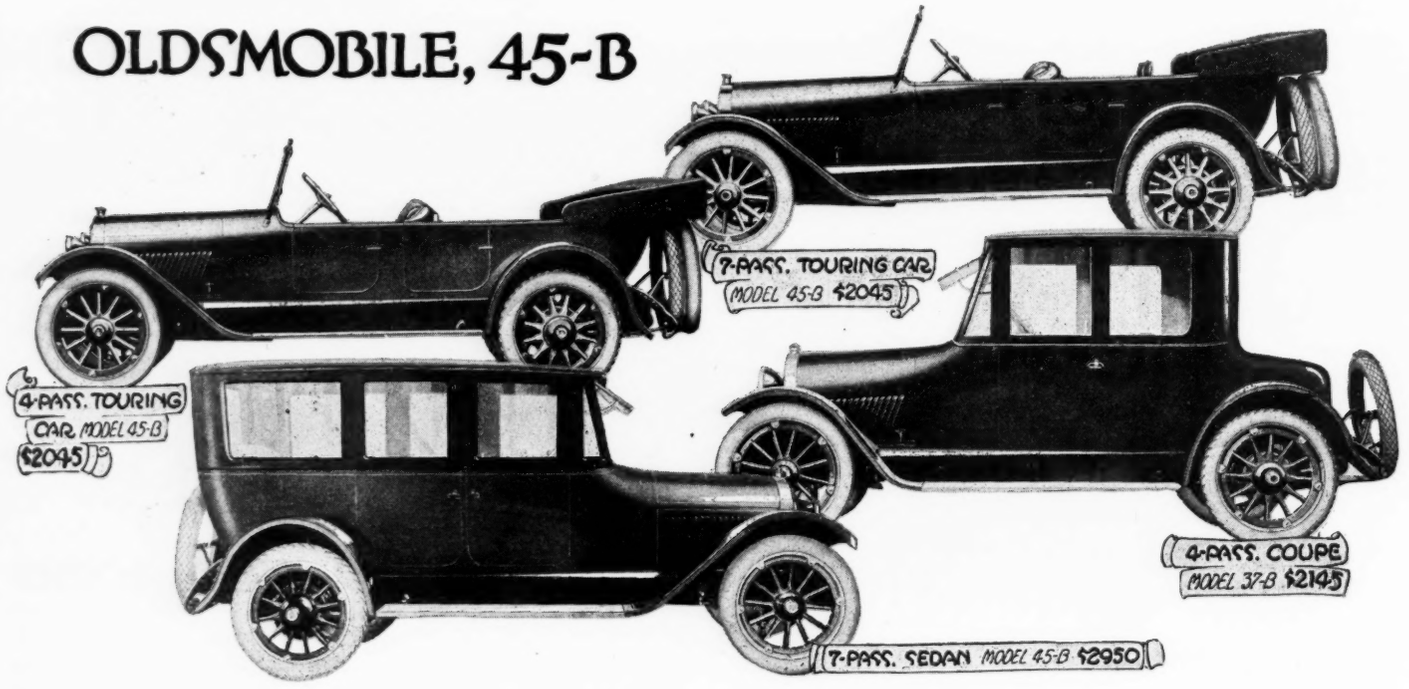
THERE are a number of refinements in the Oakland model for 1920. There will be four body styles, including touring car, roadster, sedan and coupe. The frame section had been changed from 4½ to 6½ in. and the rear engine support has been redesigned and forms part of the engine assembly. The engine in model 34C is a 6-cylinder, overhead valve type with a bore and stroke of 2 13/16 by 4¾ in. and resembles very much the construction in the former Oaklands. The Remy starting and lighting system is now used with Prest-O-Lite battery. The rear cross-member on the frame has been redesigned to add stiffness and give better protection to the gasoline tank. A tire carrier of new design has been mounted on the rear cross-member. The new car will use a new front axle with larger wheel bearings and the wheelbase has been increased from 112 to 115 in. The sedan and coupe models will be fitted with window regulators and heaters.

OWEN MAGNETIC



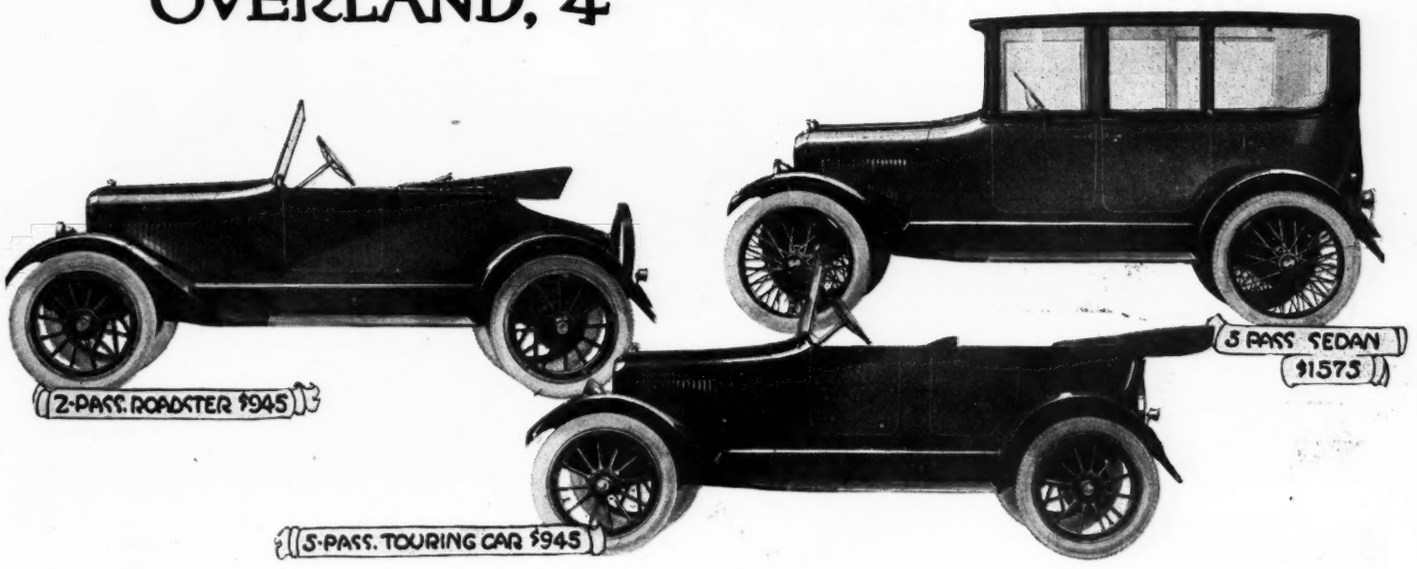
THE Owen Magnetic for 1920 will appear in much the same manner as heretofore. The Magnetic transmission is of course a paramount feature, and the electric brake switch in the floor in addition to the electric brake on the control handle makes the car very easy to handle. When a stop is necessary the control handle can be thrown from high into neutral and the foot lever depressed which takes effect immediately. This automatically reduces the speed of the car and with the foot brake it may be stopped very quickly. In front of the radiator a splasher has been designed which blends into the two side members of the frame. The engine in this car is a six-cylinder Weidely, 4 by 5½ in. The car has a 142 in. wheelbase and uses a Zenith carbureter, American rear axle and Warner speedometer.

OLDSMOBILE, 45-B



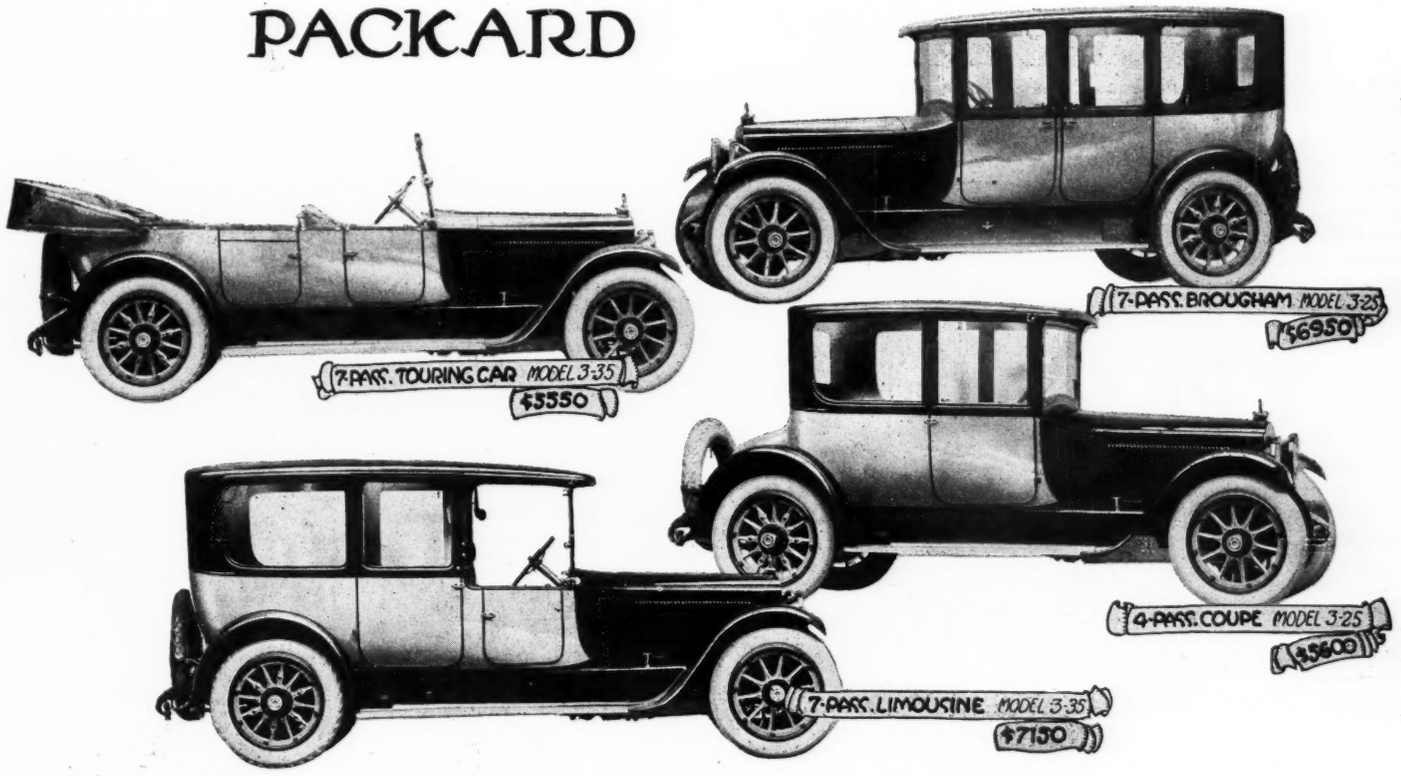
OLDSMOBILE will continue to build the two chasses turned out in 1919. These are a six-cylinder and an eight-cylinder. The six has a 112 in. wheelbase on which the ratio of power to car weight is exceptionally high. The crank cheeks on the crankshaft are so curved that their center of mass is also their center of gravity, giving a natural running balance. The eight-cylinder model has been improved in several respects. There is provision made for increased water area in the detachable cylinder and the oil pan now drains from the center through a depressed basin. Belt driving fan and generator is of Goodrich cord design. The fan is Pitter twin blade, there being four pairs of blades. The frame has been greatly straightened. The radiator is 1½ in. higher than last year and the channel section is now 7 1/16 in. deep, 2½ in. wide and 5/32 in. deep, Wheelbase has been increased 2 in. and the capacity of the gasoline tank to 20 gal.

OVERLAND, 4



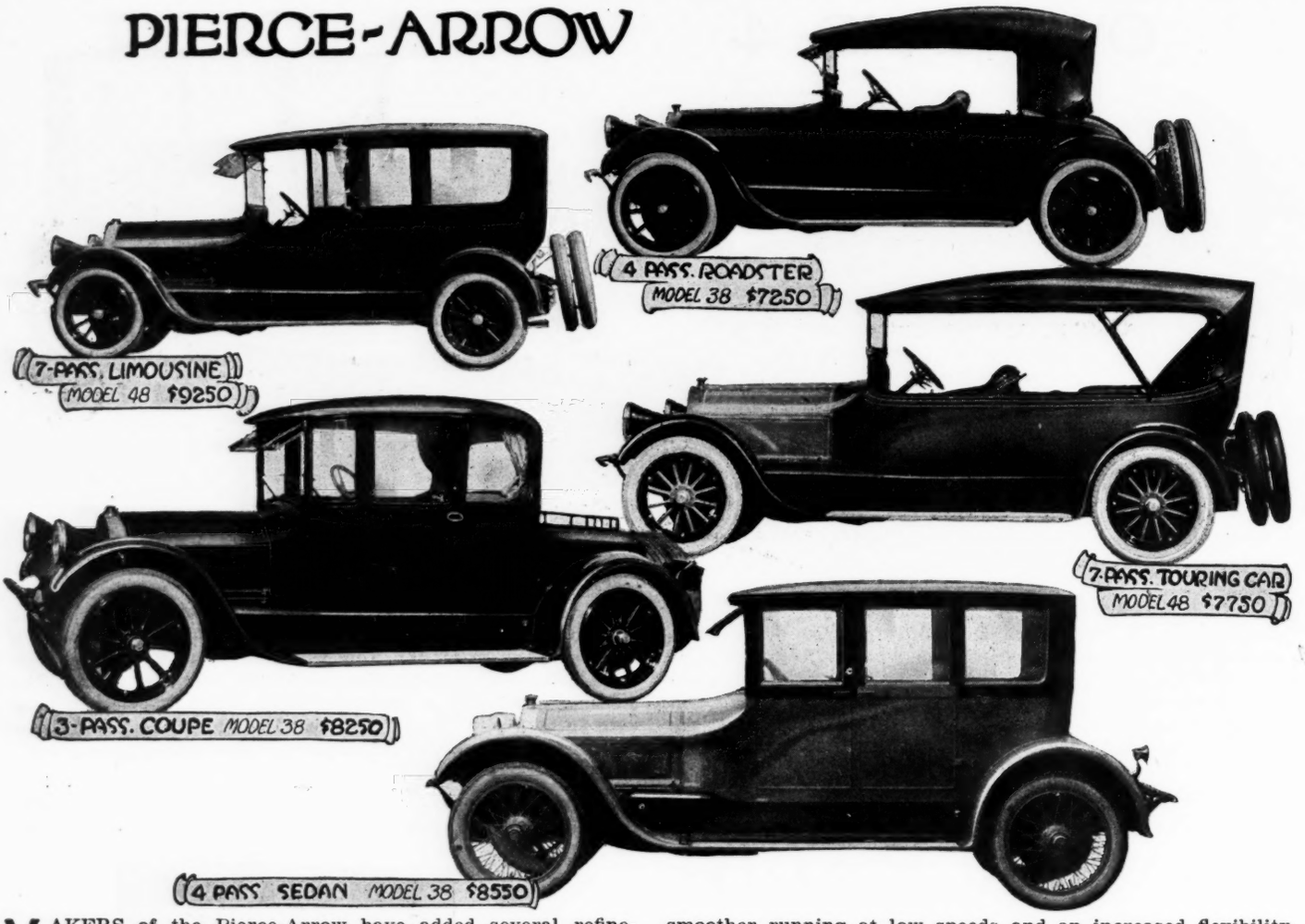
OVERLAND will concentrate its production on the Overland 4, the small car which has been featured many times owing to its novel spring suspension which affords a longer body on a comparatively short wheelbase, the latter being 100 in. The engine is a four-cylinder block cast job 3⅜ by 4 and rated at 18 h.p. The Auto-Lite electric system is used and the carbureter is a ¾ in. Tillotson. Cooling is by thermo syphon with cellular radiator. The clutch is a single plate floating ring type and operates in oil. In unit with the engine is a three-speed transmission from which the drive to a three-quarter floating rear axle is taken by 1⅜ in. propeller shaft. The steering gear is of a planetary type. Wood wheels are used with 30 by 3½ in. tires. The body line includes a five-passenger touring, sedan, two-passenger roadster and coupe.

PACKARD



PACKARD will continue its present model unchanged for 1920. This model is featured with a twin-six engine having a bore and stroke of 3 by 5 in. respectively. The stock color of the bodies is blue with any other color optional. Only three body types are furnished, these being a five-passenger phaeton, seven-passenger touring and four-passenger runabout. All are upholstered in leather. The bodies are built by the Packard company. The company also makes practically all its units, such as axles, gearset, clutch, etc. The chassis has a 136-in. wheelbase, with 35 by 5 in. tires. Bijur starting and lighting is used and Delco ignition.

PIERCE-ARROW



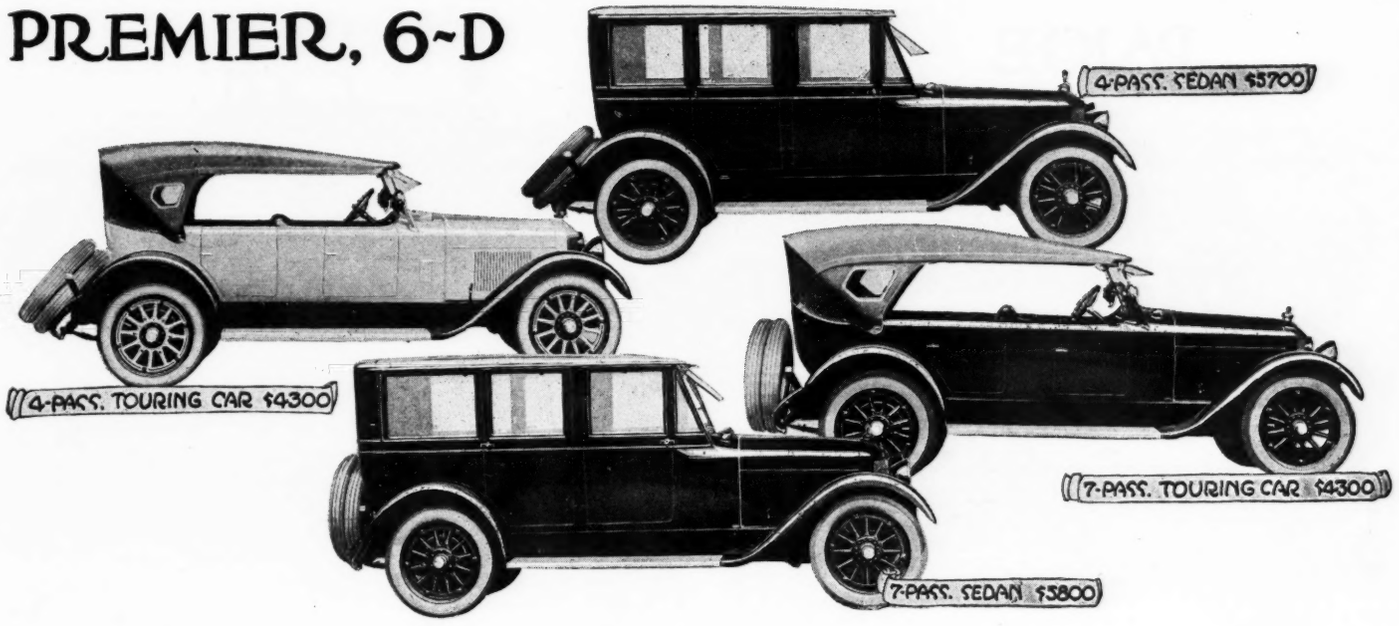
MAKERS of the Pierce-Arrow have added several refinements to the Dual Valve Six which was introduced 18 months ago. The dual valve engine, now is equipped with dual battery ignition which, the company's engineers declare, is a great improvement. The timers and distributors, working in unison, deliver two sparks simultaneously to each cylinder, insuring instant and thorough combustion. This system overcomes the faults of the battery-magneto ignition, for pre-ignition from the battery circuit depending upon the engine speed, is no longer possible, say the engineers. This results in a smoother running at low speeds and an increased flexibility. A generator of increased capacity insures an adequate flow of current to the battery, reducing danger of exhaustion. Another improvement is in the transmission which is over-running gear, robbing gear shifting of many of its problems. The shift from fourth to third gear or from third to second now is made quickly, silently and positively without clashing. The car is produced in 38 and 48 hp. Models are offered in a range of body styles designed to meet all needs in both open and closed types.

PILOT, 6-45



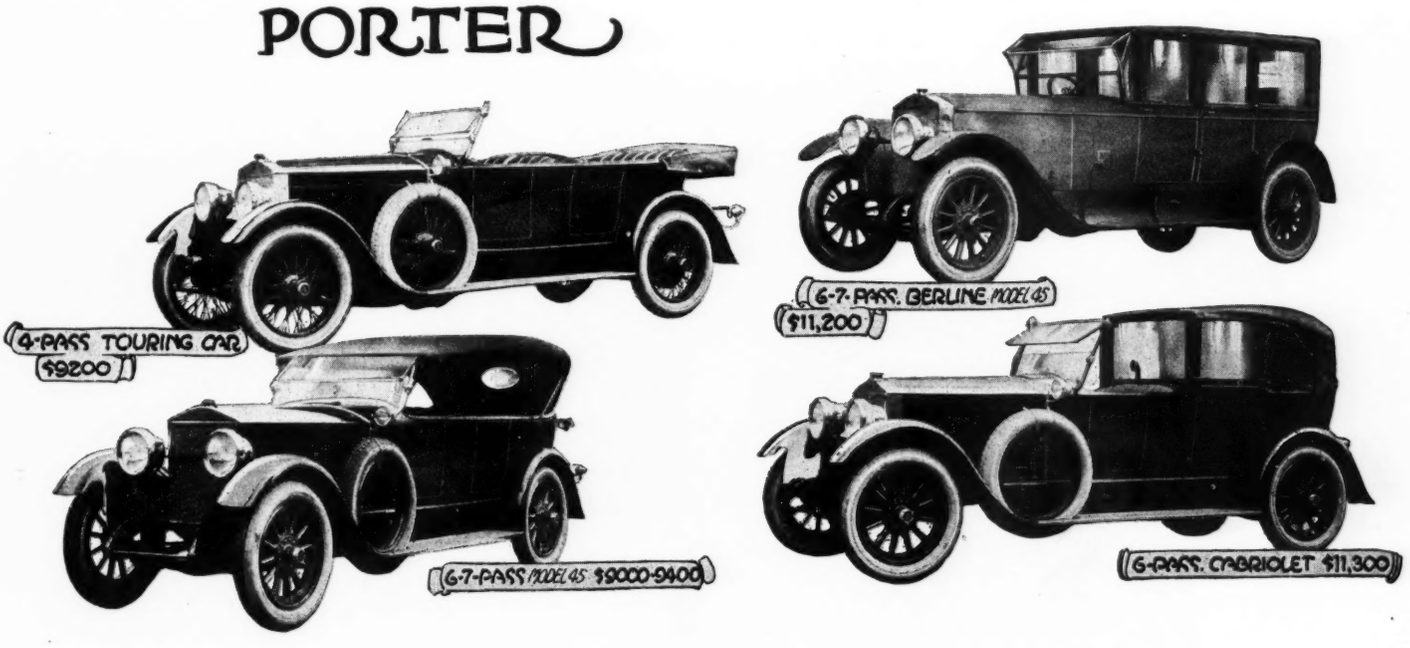
THE Pilot Motor Car Co. has made no mechanical changes in its 1920 models, continuing the same car as in 1919. The chassis is continued with no changes. This is fitted with a Teetor-Hartley six-cylinder engine with a bore and stroke of 3⅛ by 5 in., and has a wheelbase of 119 in. Other standard units such as Tillotson carbureter, Borg & Beck clutch, Hartford universals, Hess rear axle, C. A. S. steering gear and Delco ignition are employed.

PREMIER, 6-D



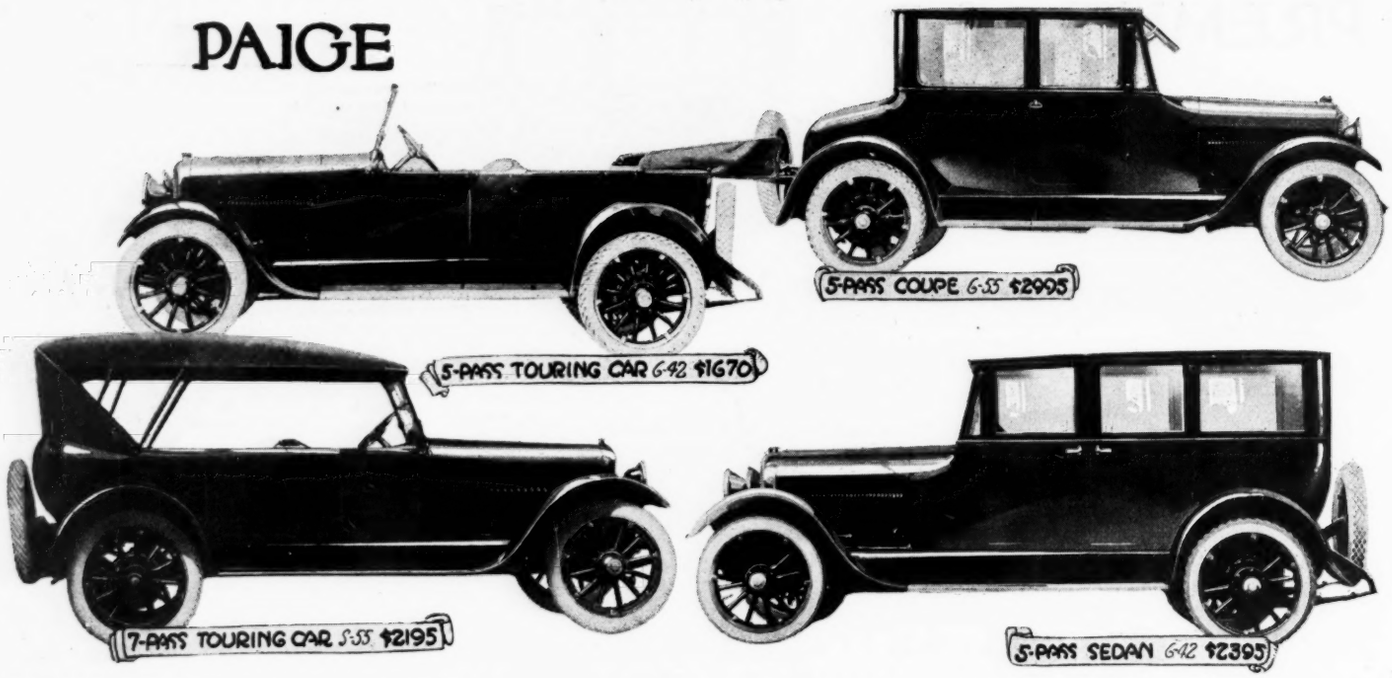
THERE will be one standard Premier chassis for 1920 having a 126¾ in. wheelbase, on which are mounted five types of bodies, these being a four and seven-passenger open car, two-passenger speedster, four and seven-passenger closed models. A peculiar curved form to the upper lines of the bodies covered by Premier patents gives the car an unusually distinctive look. A gear selecting finger lever on the steering wheel quadrant supercedes the push button control of the magnetic shift formerly mounted just below the wheel. The Premier feature of an aluminum engine is retained. One of the features of Premier bodies is the rugged framework of hardwood and while the doors are 3 in. thick which affords ample protection against distortion the result has been obtained without loss of grace. Both front and rear axles are Stanpar and the clutch a Borg & Beck. The windshield is a rigid bronze casting bolted to the top of the cowl. It is in three sections, the lower half being stationary. Hand-buffed leather, with long straight piping, backed by interlaced hair that cannot lump, and supported by Marshall springs, is regular equipment. The instrument board is made of solid walnut and is finished in ebony. All the metal parts, such as handles and fittings, are of solid nickel alloy (not plated) and cannot, therefore, rust or tarnish. The touring car tops are the semi-Victoria design fittings.

PORTER



THE Porter will be built in a seven-passenger limousine, seven passenger touring, four-passenger roadster, five-passenger inside drive limousine, six passenger landaulet and a seven-passenger inside drive limousine. All bodies are Brewster except the four-passenger roadster, which is a Fleetwood and the seven-passenger touring is by Blue Ribbon. The Porter uses a four-cylinder engine with dual valves in the head and removable cylinder heads. The engine is a 4.6 by 6.75, with magneto ignition utilizing two Berling magnetos with separate sets of plugs. The lighting and starting system is a Westinghouse 12-volt with Prest-O-Lite battery. Wood wheels with Firestone rims are used and stock equipment includes 35 by 5 in. cord tires. The equipment includes a Stewart speedometer, Hartford shock absorbers, Golde one-man top, Waltham clock and a Detroit power tire pump. The Porter car has a 142 in. wheel base.

PAIGE



INCORPORATED in a new model, known as the 6-42, Paige is exhibiting a new line designed and developed in its own factory. It is mounted on a 119 in. wheelbase chassis which with the 6-55 of 1919 on the 127 in. chassis will make up the line for 1920.

The new car is different throughout from the older model, being a smaller six, and besides incorporating the new power plant, it has a single straight line propeller shaft instead of the two-piece unit with the universal joint in the larger model. The engine and gearset are made in the Paige factory and the majority of other parts secured from well-known parts makers, including the Borg & Beck clutch, Detroit universals and propeller shaft, Salisbury axles, Kelsey wheels, Jacox steering, National car radiator, Gray and Davis lighting and starting, and Atwater-Kent ignition.

L-head constructoin is used in the 3⅛ by 5 in. power plant. The cast iron cylinder block is in a unit with the upper half of the crankcase. The head is separate and is another iron casting. The bottom pan is a stamping. The carbureter is on the left side of the block and the valves are on the right. The gases being led across the block between cylinders. The fore and aft intake passage is arranged with the bottom half in contact with the exhaust passage, having a modified hot-spot construction.

Lubrication is by combined force feed and splash.

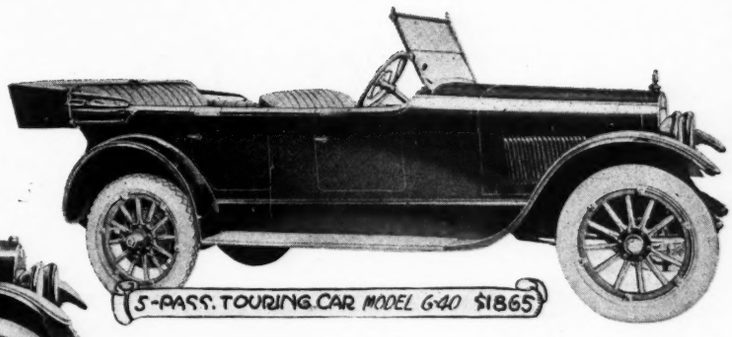
A Yale lock is fitted to gearset for holding the gears in neutral. Final drive is by the Hotchkiss to a floating axle. The bodies are straight-line moulded types.

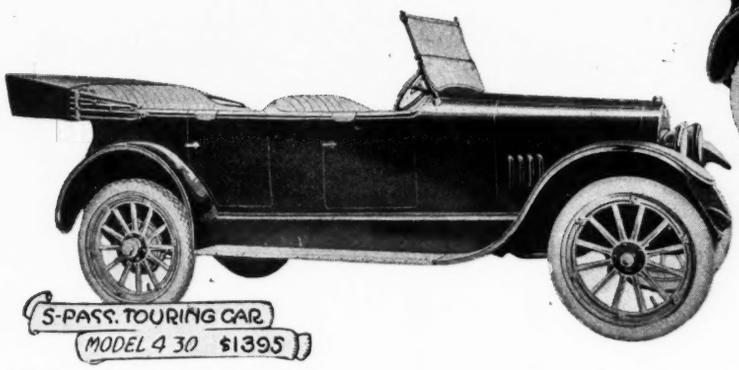
PEERLESS, 56



THE year's development in the Peerless is noticeable chiefly in the radiator, which has been raised 2 in. tending to give a straighter line to the hood with more graceful handling of the lines at the cowl, and further with the change to full crown fenders. The same chassis model which has been used since the first conception of the Peerless Eight is used with no radical changes. The wheelbase is 125 in. and this one chassis model is used for all five types of cars.

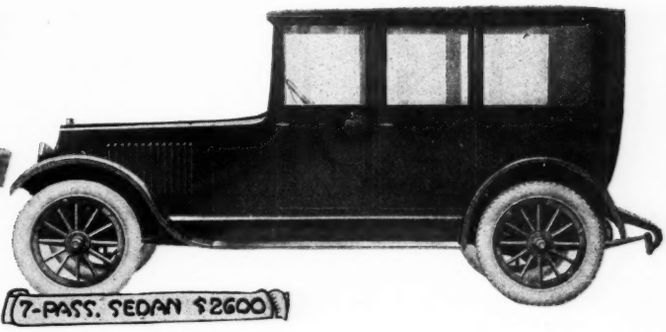
PIEDMONT

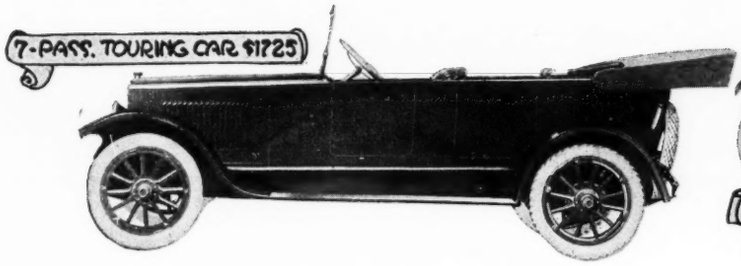




THE Piedmont four-cylinder car has been redesigned with a new bevel side body with a double cowl. The differential has been changed from straight tooth to spiral bevel tooth and the transmission has now an aluminum case and the front wheels have Timken roller bearings instead of ball and cup as heretofore. The springs are of vanadium steel instead of carbon steel as heretofore. The same changes have been made on the six-cylinder car, including a square back in the body.

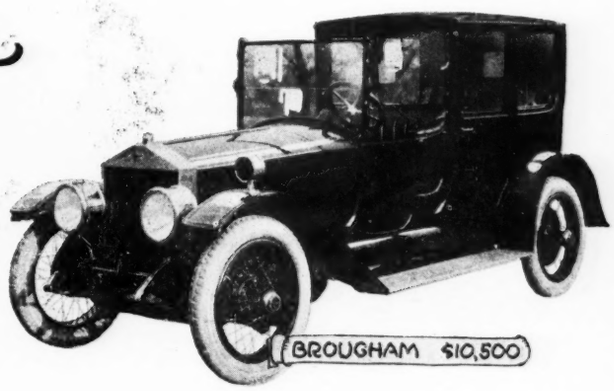
PATERSON, 6-47

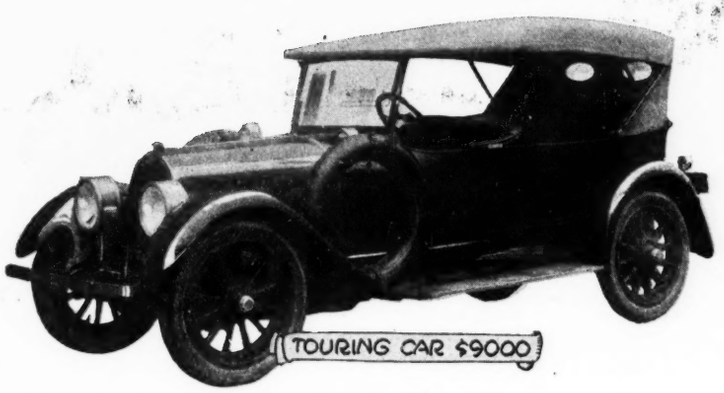




A FIVE-PASSENGER touring car and sedan features the 1920 line of the Paterson, which uses a 120 in. chassis powered with a Continental engine. The car uses Hotchkiss drive with 58 in. rear springs underslung on the rear axle. The latter is driven by spiral bevel gears and the pinion shaft is supported by two bearings. The clutch is a Borg & Beck and the Delco starting, lighting and ignition system is used. The body has very wide doors and is a straight line design throughout. The seats are quite roomy and upholstered over Marshall springs. The gypsy curtain in the rear is fitted with two oval plate glass lights. The general color scheme consists of a dark blue body with black fenders and wheels. Wood wheels are used with tires 33 by 4 in. and equipment includes the usual quota of instruments on the dash and a full ventilating rain vision windshield.

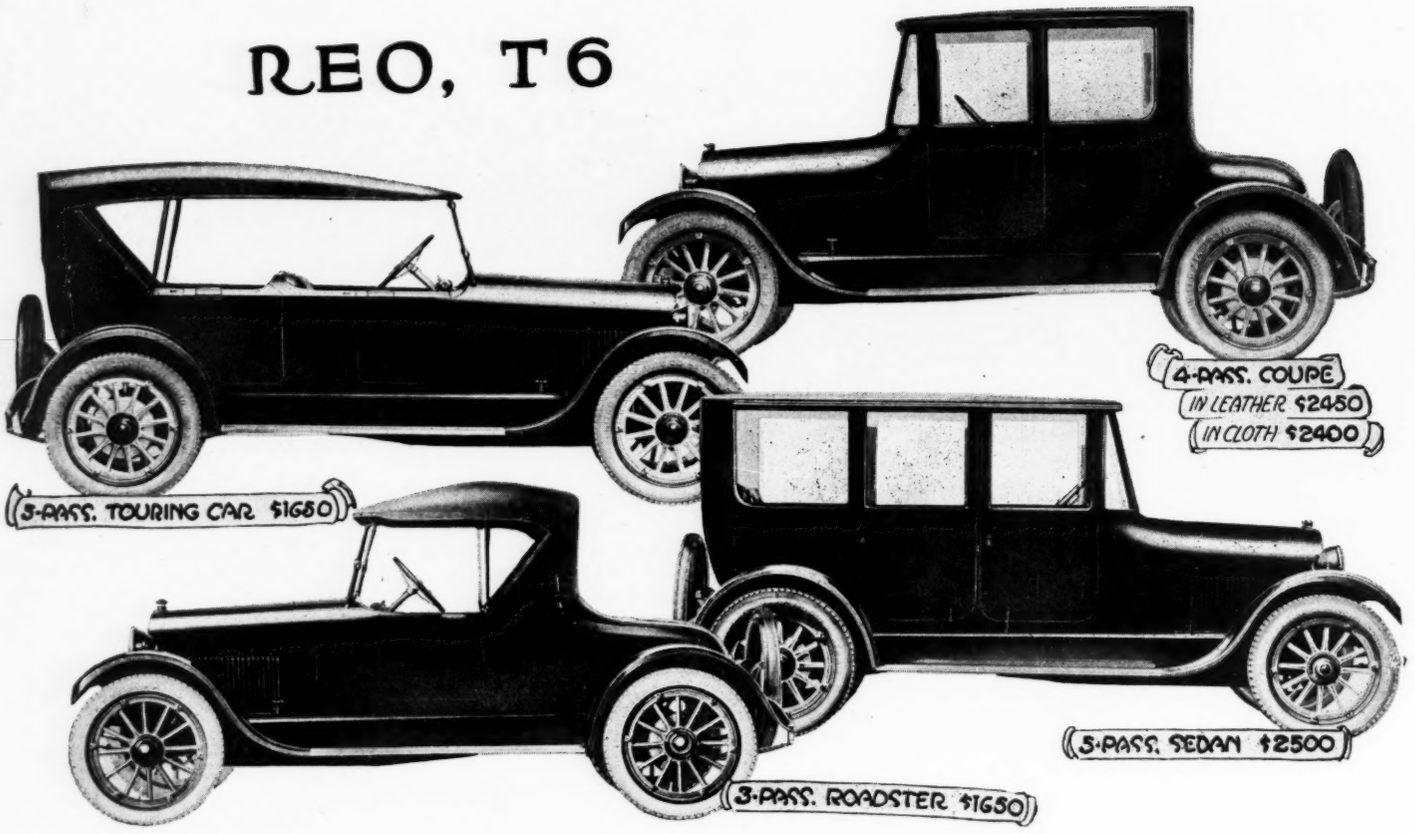
PHIANNA, R





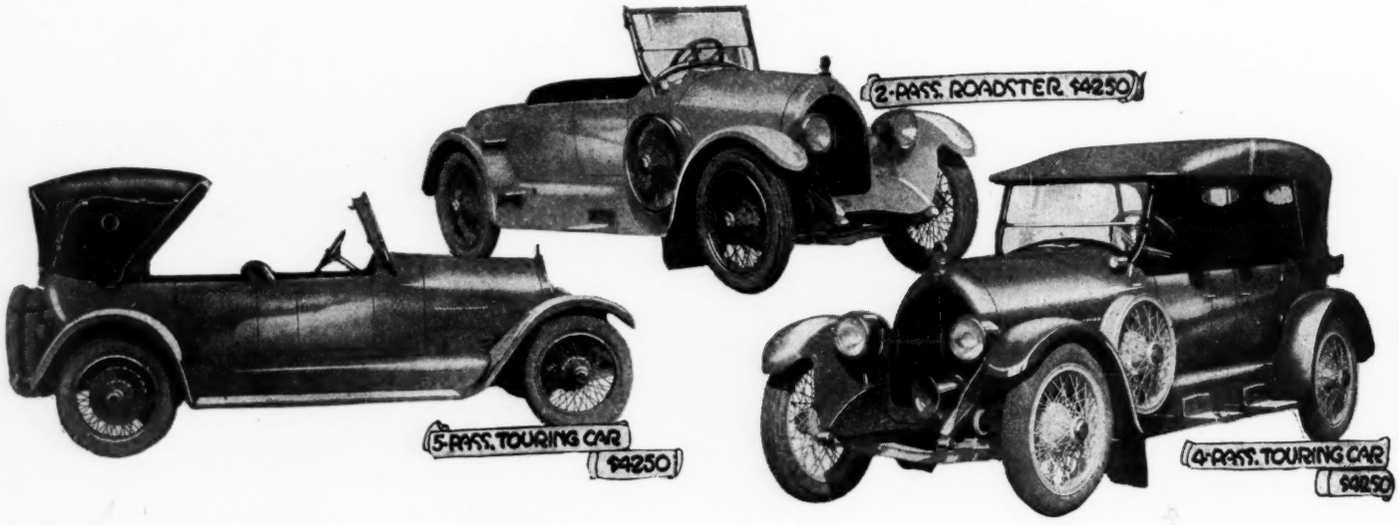
ONE standard chassis for the Phianna is built, upon which are fitted special custom made bodies to suit the taste of the customer. The company makes its own engine, transmission, front axle, etc. The engine is four-cylinder of 3 29/32 by 6 in. bore and stroke, and transmission is four speeds forward. The wheelbase is 128 in. and cord tires are standard.

REO, T6



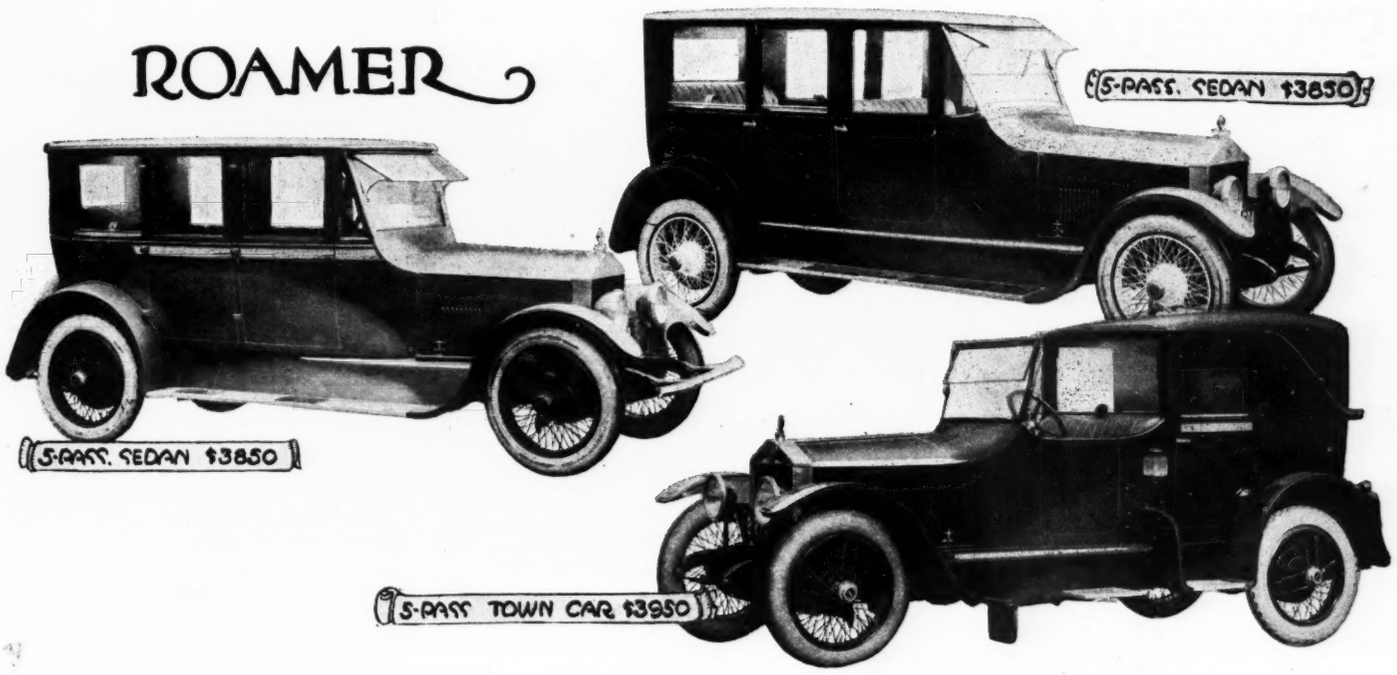
ONLY one model will be produced by Reo for 1920 in order to get increased production. The new car is a six-cylinder 3 3/16 by 5, replacing the four and six of last year. The chassis is identical with that of former years except for refinements, while the new engine is quite similar to its predecessors. The large six has been entirely abandoned. A five-passenger body and three-passenger roadster mounted on a 120-in. wheelbase with 33 by 4 in. cord tires comprise the line for the present. Later closed models will be added. Block cast cylinders are used for the first time by this concern, but the valve layouts, etc., are the same essentially. Accessibility is one of the chief features of this new model. Altered appearance is largely due to the removal of the peaked radiator associated with Reo for the last few years. The new radiator has a straight front and the general body lines have been changed. Alemite lubrication is a chassis feature.

REVERE



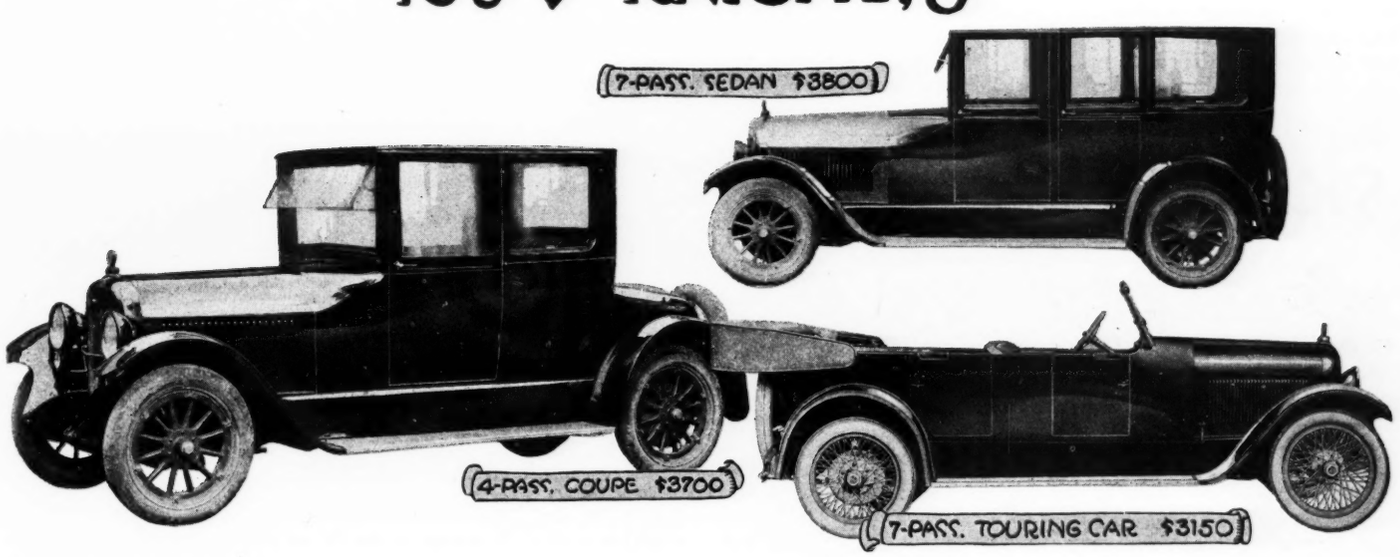
REVERE will use two types of engines in its cars this year which include a two-passenger sport model, a two-passenger with collapsible rear seat, four and five-passenger touring cars, and a four-passenger sedan. The engine built by this company is a Duesenberg type, using horizontal valves. The difference between this engine and the Duesenberg 4⅜ by 6 engine is that the former uses 4 in. rocker arms against the latter's 14 in. The ReVere company brought the camshaft in its engine up to the side and changed from gears in the front assembly to silent chains. The engine is a four-cylinder. In addition to this engine the company will use a 4⅜ by 6 Duesenberg engine built by the Rochester Motors Company, Rochester, N. Y. There is no change in the length of the wheelbase of the car and the Bosch magneto, Westinghouse starting and lighting, Brown-Lipe transmission and American ball bearing axles are retained.

ROAMER



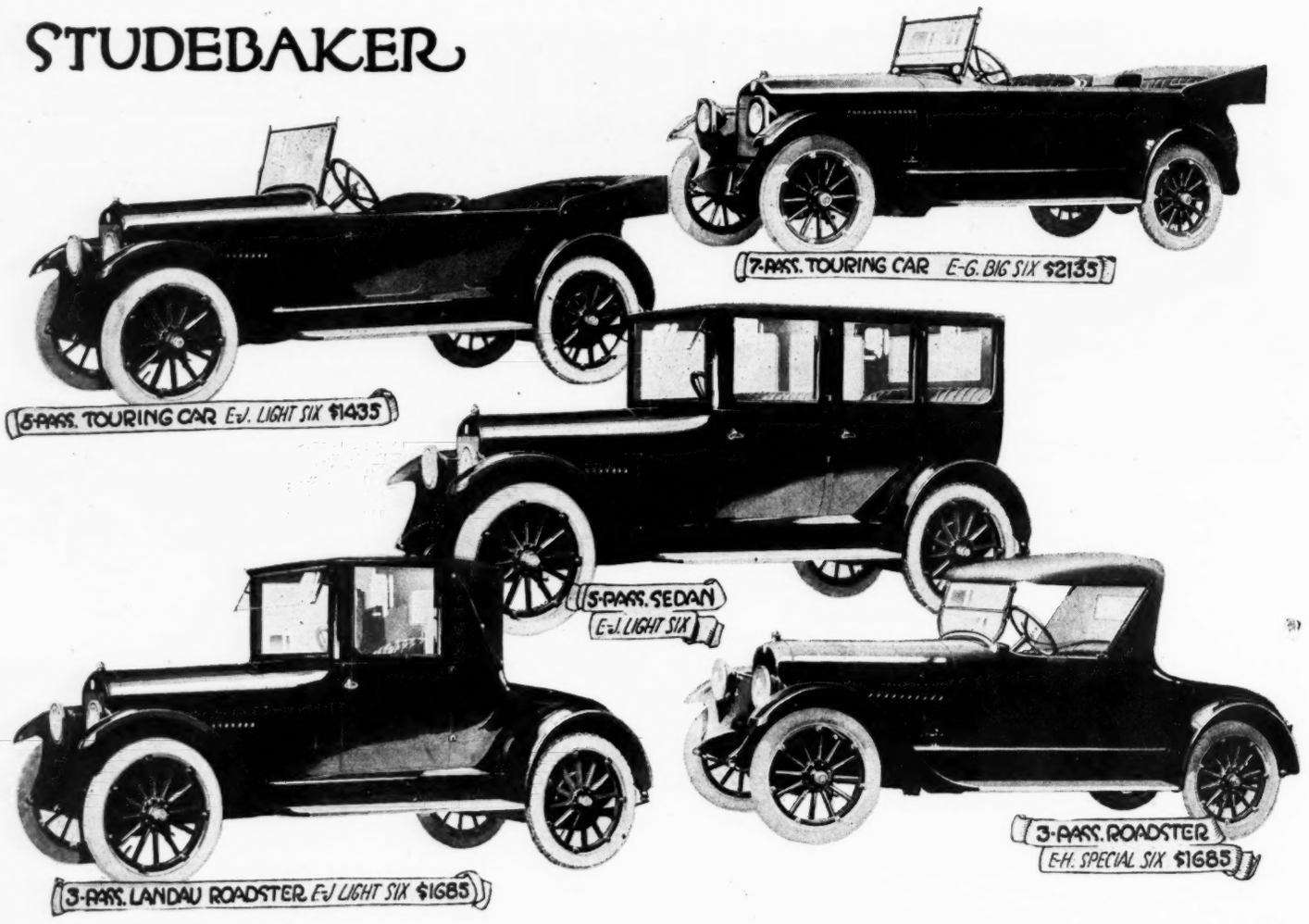
A CHOICE of either the Continental or Duesenberg engine is offered in the new Roamer, which is exhibited at the show. Those cars made by the Barley Motor Car Co. are offered in either open or closed lines, a specialty having been made of the closed type of body. Four of the closed designs are Rubay products, these being the sedan, limousine, landaulet and town car, the cabriolet, coupe and suburban are built by the Barley company. Salisbury axles, long radiator and Hayes wheels are fitted with Goodyear tires. The Continental engine used is 3¼ by 4½ in., with the carbureter bolted directly to the cylinder block. This is one of the newest of the L-head engines made by this concern for the trade and incorporated a hot-spot construction, and a very heavy crankshaft. It is cooled by centrifugal circulating system and lubricated by combination pressure and splash. The carbureter is a Stromberg 1-in. side outlet type. Starting and lighting is provided by an electric autolite system. Hotchkiss drive with tubular propeller shaft and semi-elliptic springs is utilized, the rear axle being a three-quarter floating, with a housing of reinforced pressed steel. The feature of the construction of this axle is that the driving gear and differential are mounted on a separate carrier, which is bolted to the housing and removable without taking the axle from the car. The hand brake is on the front universal joint at the rear of the gearset. The wheelbase is 121 in. Rather distinctive lines are incorporated in the body, the radiator being angular with the lower end narrower than the top. A straight line is carried from the front end of the radiator to the rear part of the tonneau running along the profile edge with a bevel. The doors are 24 in. wide and the curtains open with the doors.

R & V KNIGHT, J



R & V. KNIGHT is an old friend under a new name, the car being the Moline-Knight which changed its name on account of confusion with other cars built in the same city only a few weeks ago. The R. & V. employs a six-cylinder Knight engine of 3⅛ by 4½ in. bore and stroke, Wagner starter, Bendix drive, thermo-syphon cooling, Borg & Beck clutch, Brown-Lipe transmission, Wagner ignition and lighting, and has a V-shaped tubular radiator. Body styles include a four-passenger sport, seven-passenger touring, four-passenger coupe, seven-passenger Sedan, two-passenger roadster models, all mounted on the same 127 in. wheelbase chassis.

STUDEBAKER



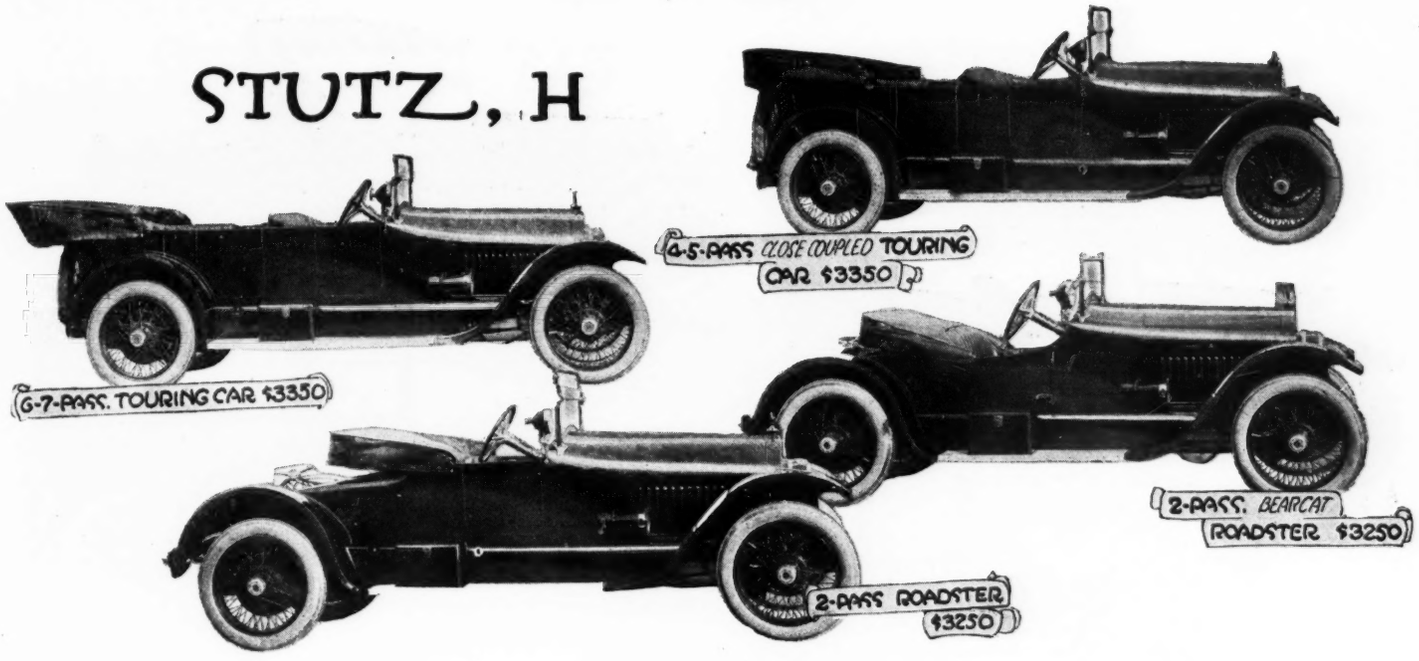
THE Studebaker line for 1920 will include a five-passenger touring, five-passenger sedan, and three-passenger landau-roadster. All of these are mounted on a 112 in. wheelbase chassis fitted with six-cylinder engine of 3½ in. bore and 4½ in. stroke. The body design has been developed which by virtue of its low lines gives the car an appearance of considerable length. Studebaker is the first car in its price class to equip with cord tires as standard equipment, these being 32 by 4 in. The engine is a cast in block job and to insure quiet operation and balance of reciprocating parts the crankshaft and connecting rods are machined all over which is a noteworthy departure for a quantity production car. The engine has a detachable aluminum head which also takes in the passages of the intake manifold. A feature of the engine is the inclination of the valves which brings them closer to the cylinder bores. Another feature of the engine is the compact accessory unit comprising generator, oil pump and distributor. The power plant is supported on a subframe making a straight line drive through a tubular propeller shaft and two flexible universal joints. Other features of the new Studebaker include a semi-floating rear axle, amidships transmission, 32 by 4 in. tires and a gear ratio of 4.55 to 1. The wheelbase is 112 in.

SKELTON



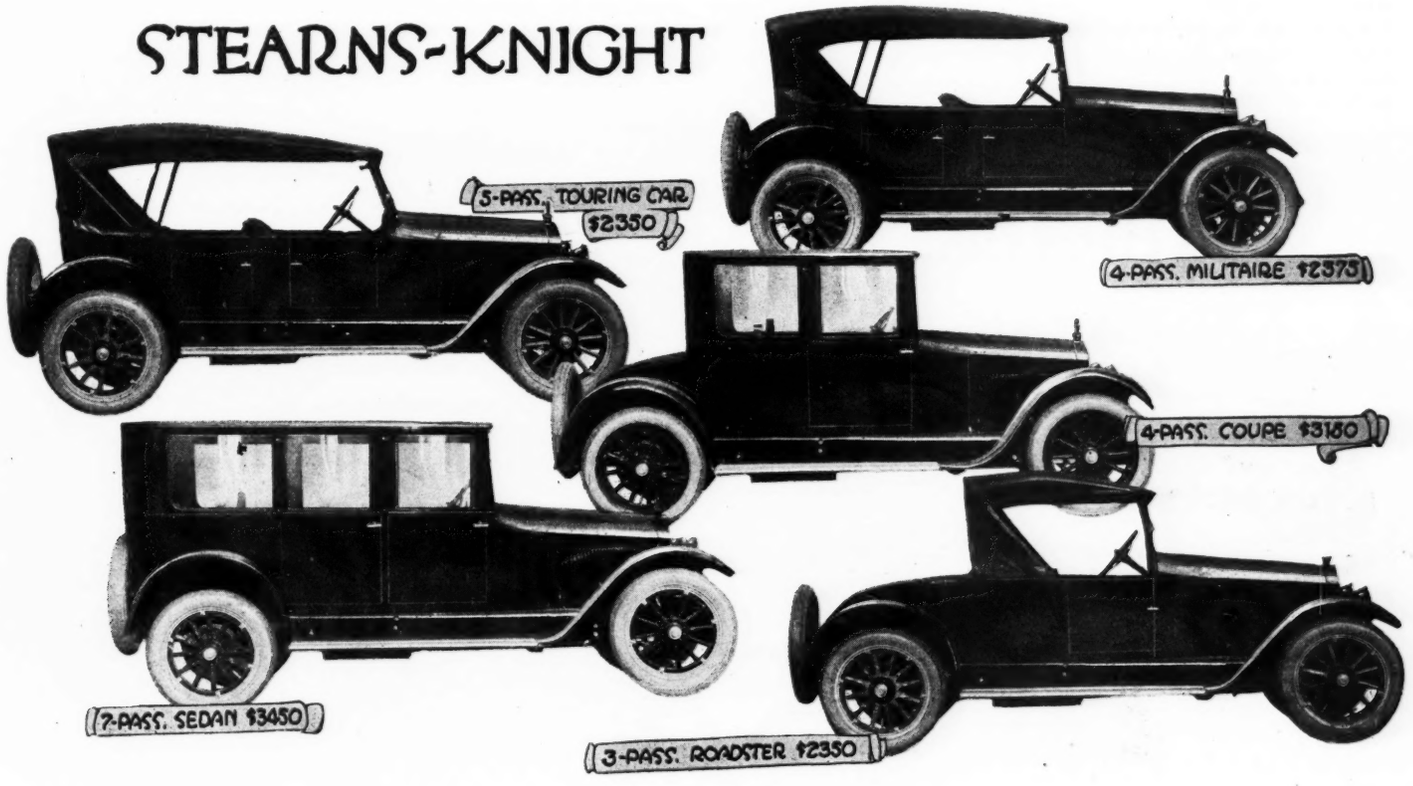
THE Skelton will be made in a five-passenger touring body and two-passenger roadster for 1920. The engine is a four-cylinder Lycoming 3½ by 5 in. Westinghouse starting and lighting is used and the carbureter is a Carter. The clutch is a Borg & Beck and the rear axle a full floating with spiral bevel gears. Springs are semi-elliptic and the tires 32 by 3½; the car has a 112 in. wheelbase. The equipment includes Stewart speedometer, ammeter, oil gauge, ignition and lighting switch, cowl light, etc., mounted on a walnut board. There is a large storage compartment under the rear deck of the roadster. Standard finish of the car is black and a set of five wire wheels is optional.

STUTZ, H



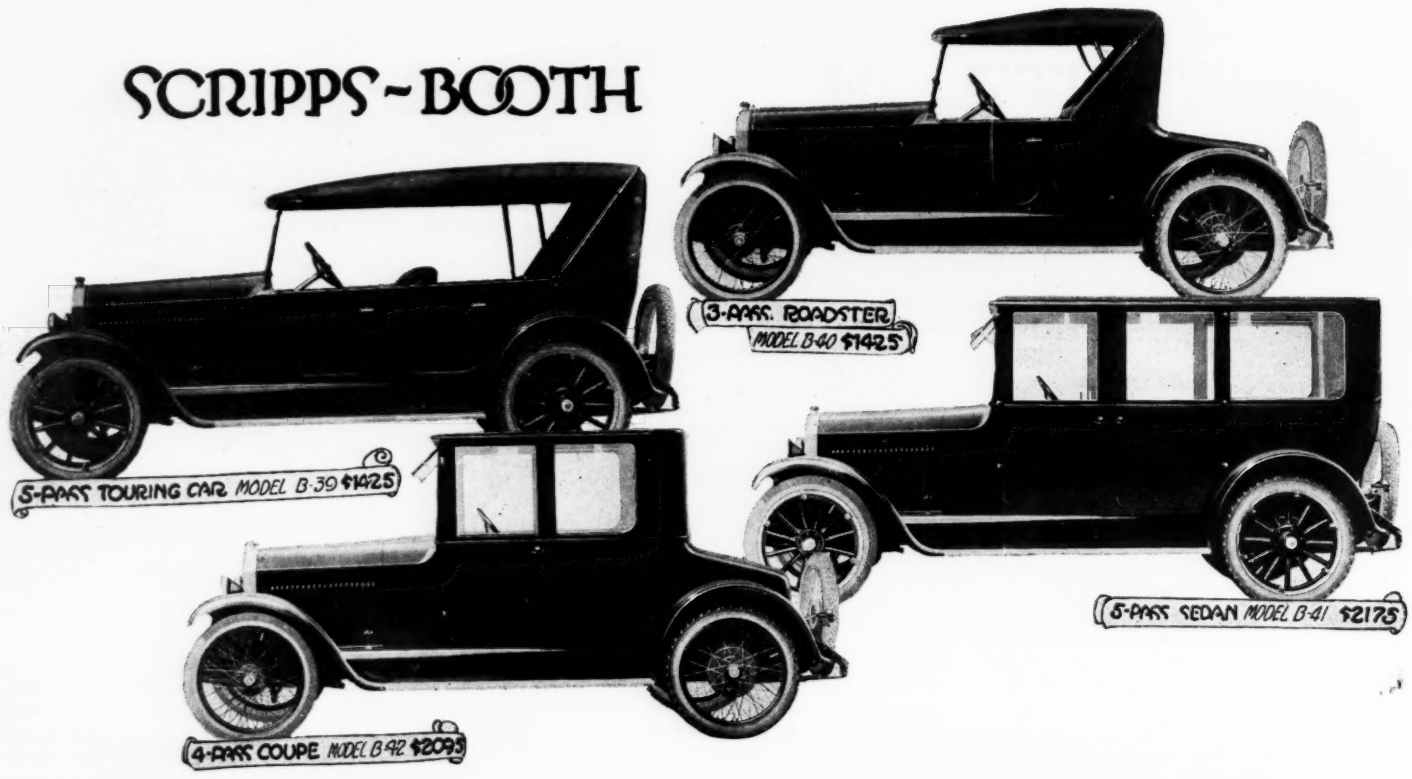
AS has been the custom of the Stutz company there are no radical changes in the 1920 car. The only change consists of a slight alteration in the cowl. The company will produce this year the well known Bearcat model, a two-passenger racy type finished in the standard canary yellow, two-passenger roadster which is for the more conservative business man and along typical Stutz lines, a four to five-passenger closed-coupled model in elephant gray, a six to seven-passenger touring car in ultra-marine blue all of these cars are fitted with black enamel wire wheels, black enamel fenders, nickel and black lamps, windshield and trimmings. The equipment includes shock absorbers, motometer, cord tires and as usual the cars all carry the four-cylinder sixteen-valve T-head engine which has characterized this car for several years.

STEARNS-KNIGHT



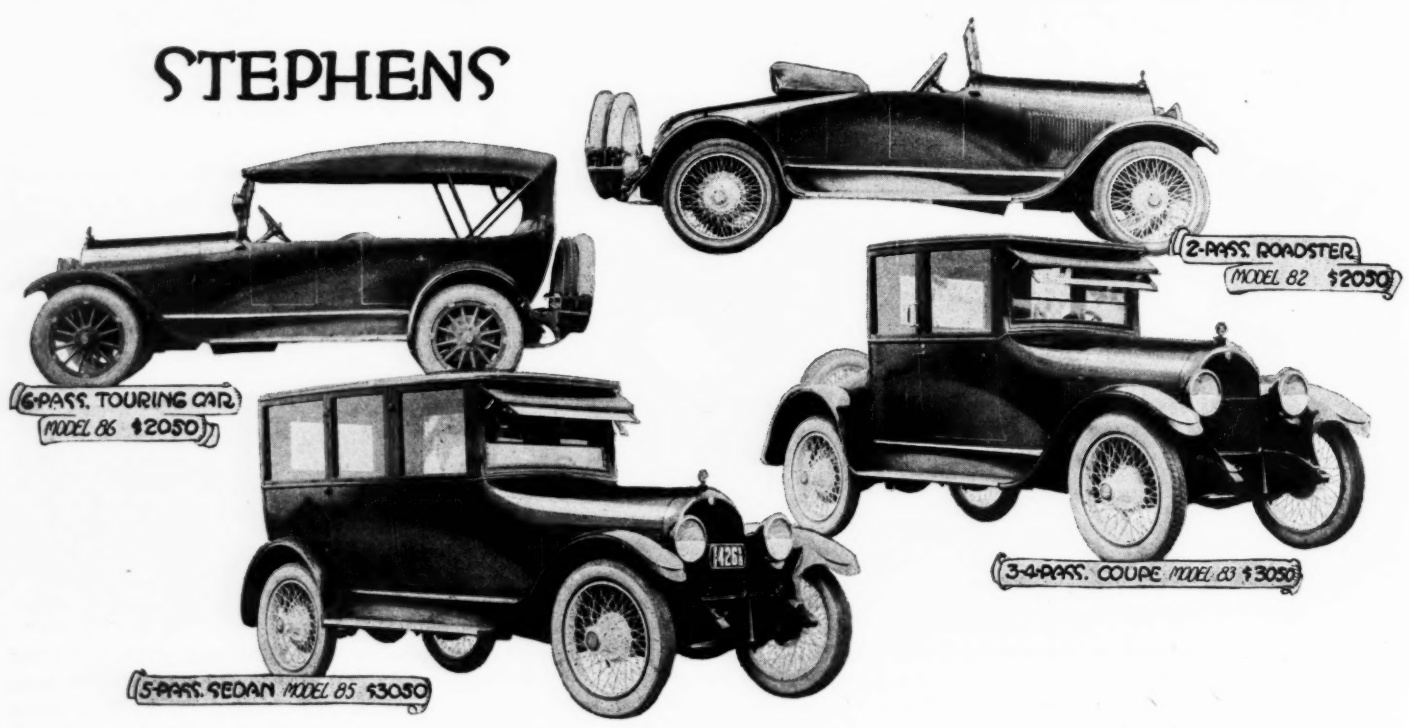
STEARNS will continue to manufacture but one chassis, a 125-in. wheelbase job in which is mounted a four-cylinder sleeve valve engine of the same general design which has been used in place of iron in some instances and have lightened up the product so that the present Stearns is one of the lightest cars the company has made. Both brakes are now on the rear wheels, a transmission speedometer drive is supplied and the electrical equipment is now Westinghouse, with Atwater-Kent ignition. The general outline of radiator and hood have been altered to conform to modern car design. The sharp bevel edge on the body has been discarded. The same chassis with only a difference in spring capacity mounts a three, four, five and seven-passenger open body and coupe, sedan and limousine types of closed bodies.

SCRIPPS-BOOTH



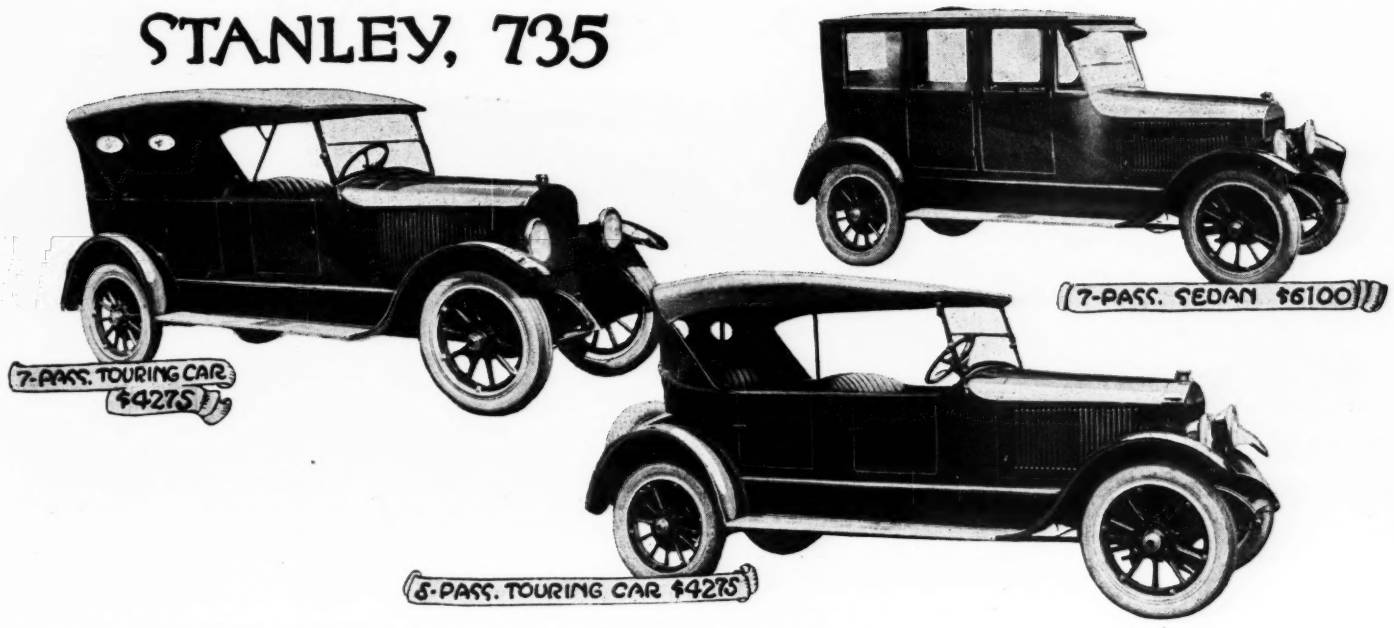
FOUR body styles, all mounted on the same chassis, comprise the 1920 offerings of the Scripps-Booth line. The bodies consist of a five-passenger touring, five-passenger sedan, three-passenger roadster and a four-passenger sedan. The chassis wheelbase is 115 in. and the car uses a six-cylinder engine 2 3/16 by 4¾ in. Lubrication of the chassis is by the Alemite system. One of the features of the touring car consists of the filing away of the side curtains in a metal lined compartment back of the front seat, so that the celluloid lights never are wrinkled or cracked. Upholstery is in genuine leather laid in French pleats over curled hair. To the right of the curtain storage compartment is a light for illuminating the tonneau and rear half of the curb side of the running board. It can be used as an extension light as well. Tools and the Alemite gun are carried in a door pocket. The sedan and coupe have some features in common, such as heavy wool coach cloth upholstery, silk curtains and Roman finish silver plated trimmings.

STEPHENS



STEPHENS this year is showing five models in their Series 80, two-, four- and six-passenger open styles and a four-passenger coupe and a five-passenger Sedan. Few changes have been made in the six-cylinder engine, most of them being of a minor character. Bodies embrace many refinements, with wider doors, deeper upholstery, exterior door handles and cabinet built compartments the chief features. Wire wheels are standard equipment.

STANLEY, 735



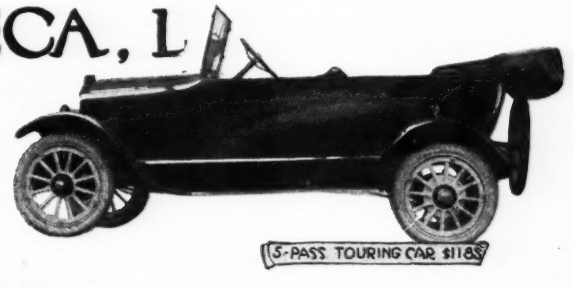
FOR the second time in the twenty-four years in which it has been built, the Stanley Motor Carriage Co. is exhibiting at the national automobile shows this year. Lower construction is conspicuous, emphasizing the comfort of the new aluminum bodies. A flat front fin-and-tube condenser replaces the V-shaped design. Many important advances in steam automotive engineering also are featured in the new Stanley models. No departure may be looked for in fundamental design, but refinements are numerous in boiler construction and insulation. The burner is a self-contained unit, vaporizing the fuel with its own heat.

STANDARD



THE Standard Eight is offered in four body styles, a four-passenger roadster, seven-passenger touring car, four-passenger coupe and seven-passenger Sedan. This is to be followed in a few months by a line comprised of a four-passenger Brougham and a seven-passenger vestibule Sedan. The chassis is fitted with an eight-cylinder engine with a bore and stroke of 3¼ by 5 in. The engine is of the Pittsburgh Model Engine Co. make and develops 33.8 hp.

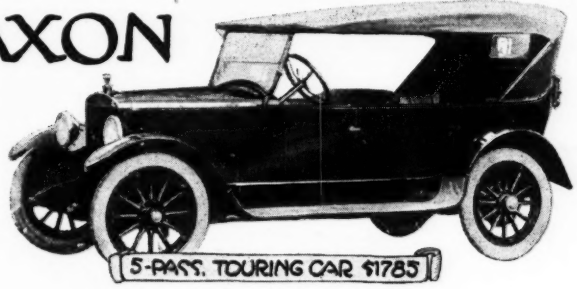
SENECA, L



THE general body lines of the Seneca have been changed to get a straight line effect. To do this the radiator has been increased in height two inches, incidentally affording more cooling surface. Concealed hinges on the hood, outside door-handles, and a deeper frame section also have been adopted.

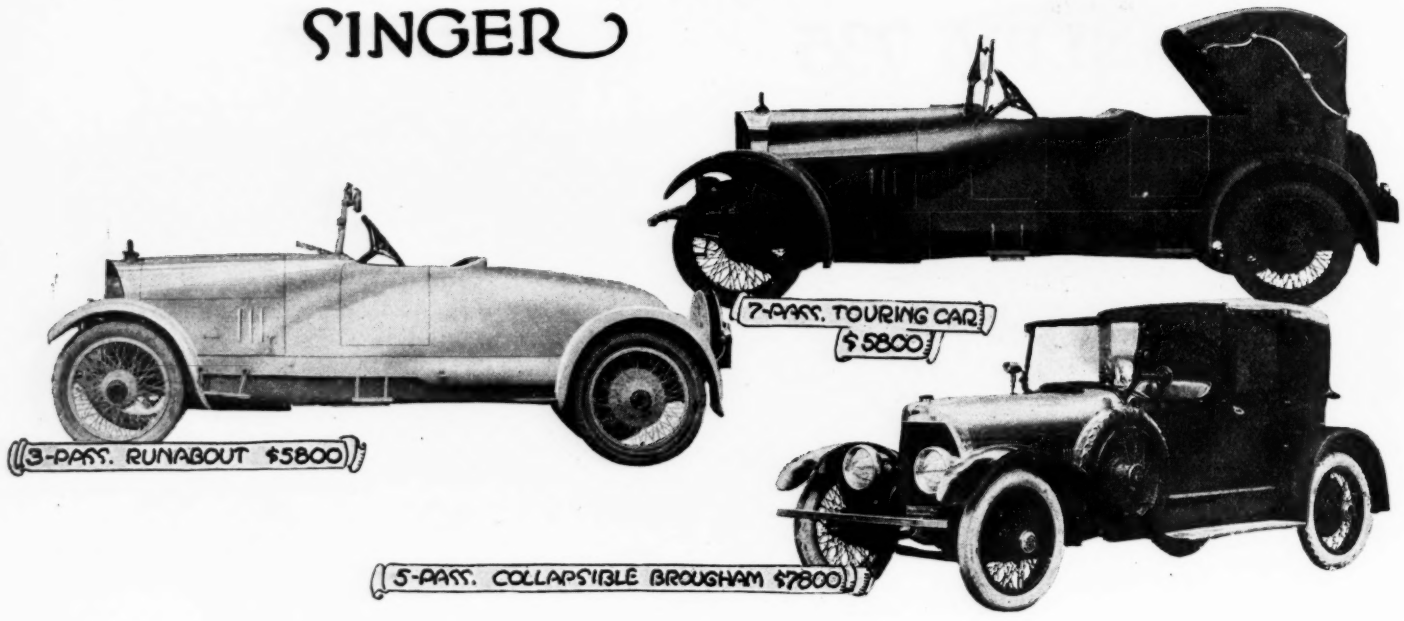
six-cylinder block cast job 3⅛ by 5 in. A hot spot is incorporated in the intake manifold being so designed that the heavier fuel particles are thrown into the heated recess while the lighter parts are conveyed into the manifold. The carbureter is a Stromberg fed by vacuum feed from a gasoline tank on the rear. The rear axle is floating type, the drive and torque being taken through radius rods and a torque member. The rear spring is a cross cantilever type, familiar in Brush designs. The gearset is a Covert. Starting, lighting and ignition is of the Wagner make.

SAXON



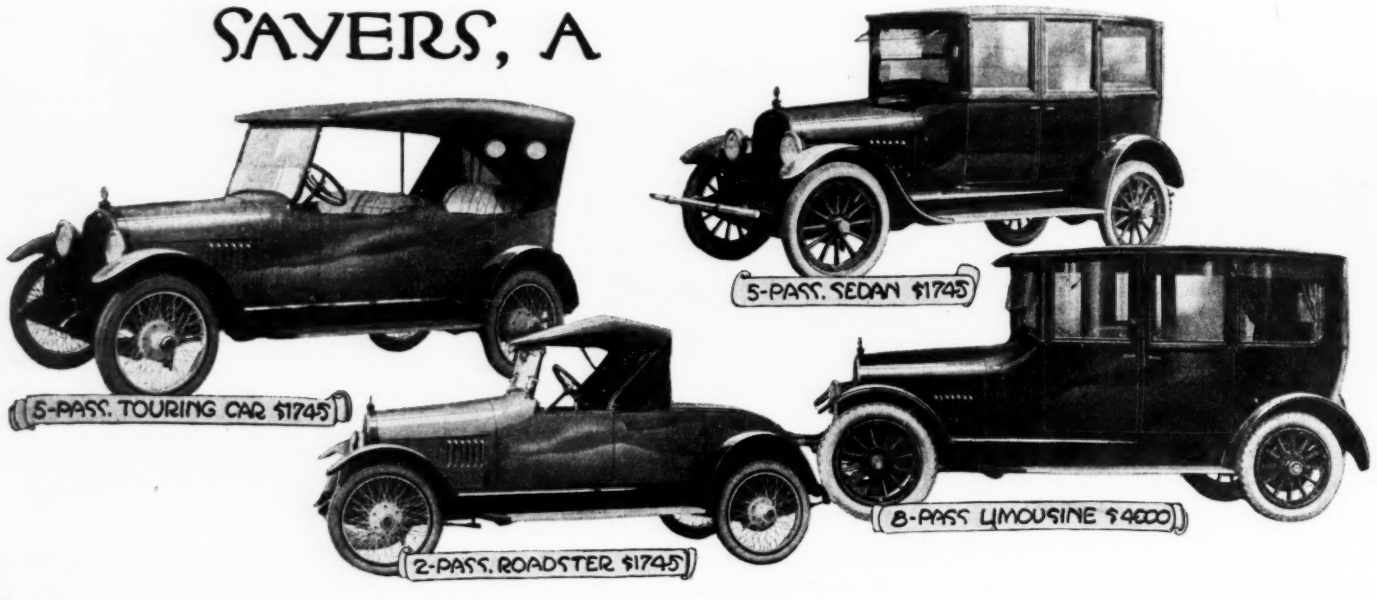
THE Saxon appears in an entirely new form this year. It uses a 112 in. wheelbase chassis of the well-known Brush type. The engine incorporates the Brush overhead valve gear, which can be adjusted while the engine is running. It is a

SINGER



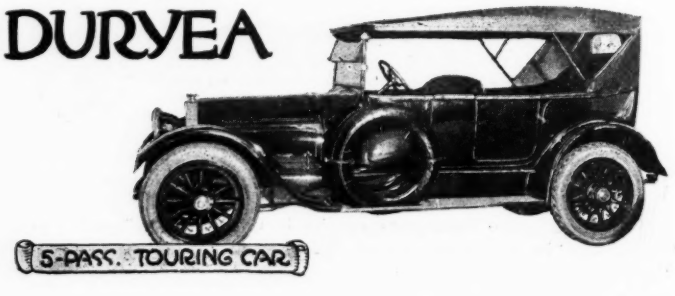
THE 1920 Singer line will include a four, six and seven-passenger open car and four types of closed bodies. The company recently was reorganized and heretofore built a six-cylinder car. The new cars will use a twelve-cylinder Weidely engine of 2⅞ in. bore by 5 in. stroke. The outstanding feature of this car aside from its custom built bodies is the heavy frame, the side members having a depth of 8½ in. and the flange width of nearly 3½ in. With this type of frame it is claimed impossible to get any body weave or door rattle. In the seven-passenger car the weight of the car ready for the road is equally distributed between the four wheels, which is claimed to favorably affect the steadiness of the car on the road.

SAYERS, A



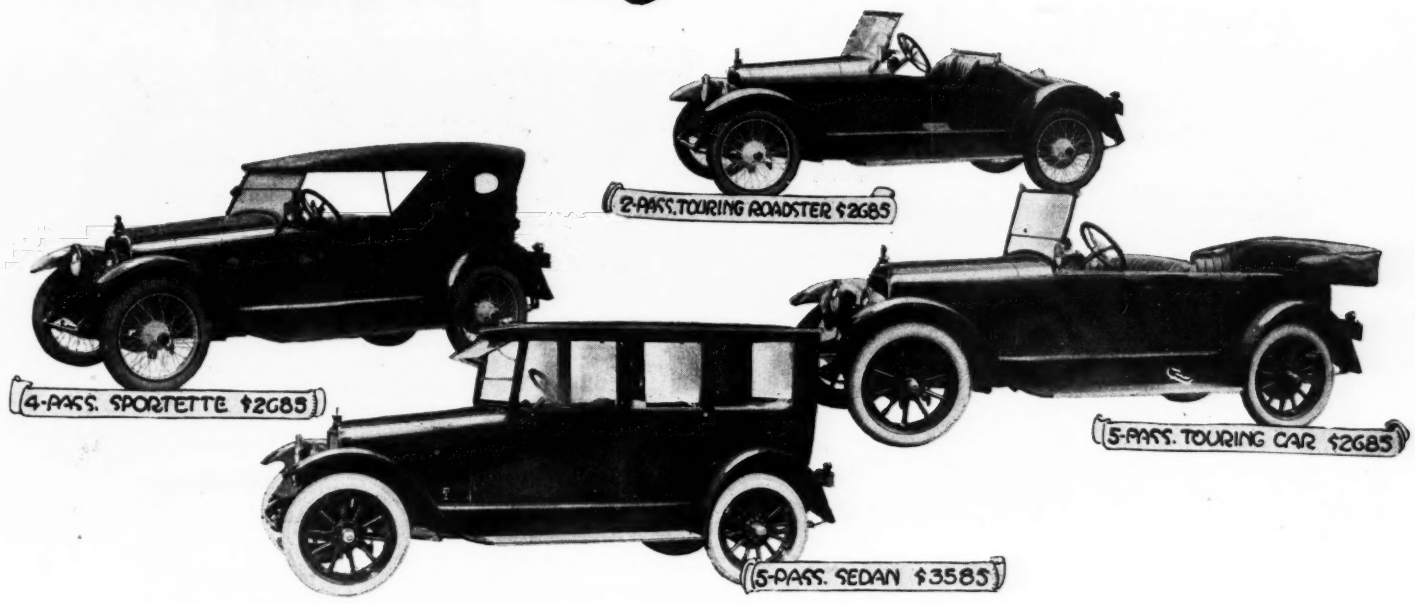
THE Sayers Six is made from standard units and a complete description of it appears elsewhere in this issue. It is one of the new cars of the show season, its first appearance coming at the same time as the Chicago show where it is being exhibited at one of the hotels.

STEVENS-DURYEA



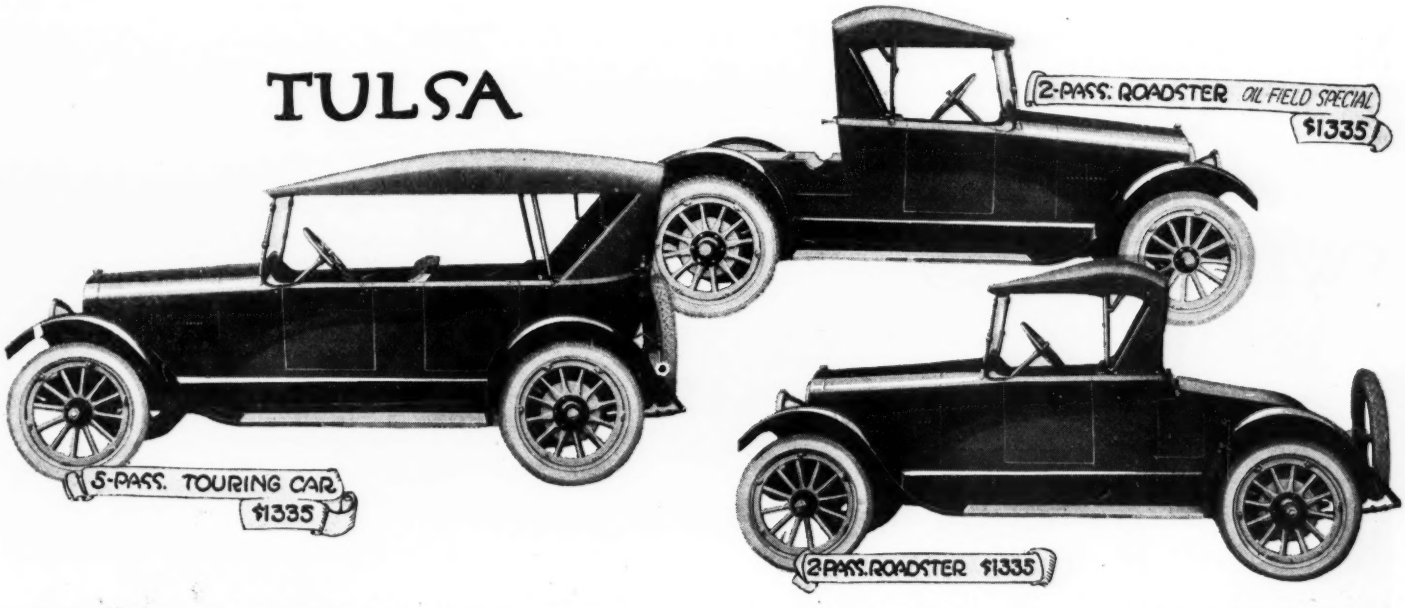
STEVENS-DURYEA has come back on the market this year with a car that closely resembles its former model, which has not been in production for several years.

TEMPLAR, A-445



THE Templar cars offered this year show no mechanical changes over last year's models, except for slight changes in the body styles, accessories and equipment. The latter is very complete on Templar models and include such parts as Motometer, windshield cleaner, tire pump, eight-day clock and winter-type side curtains. The line includes a four-passenger sportette, a five-passenger touring, two-passenger roadster and a five-passenger sedan. The roadster has a distinguishing mark in the way of an aluminum step on the side of the body and a heavy protecting pad. No doors are used on this model.

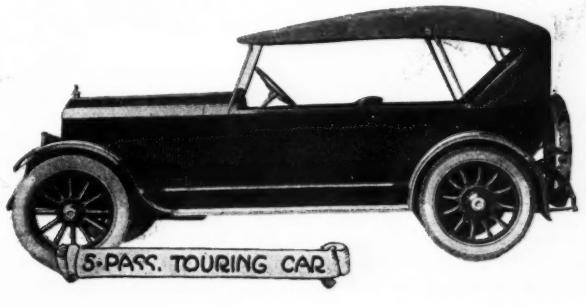
TULSA



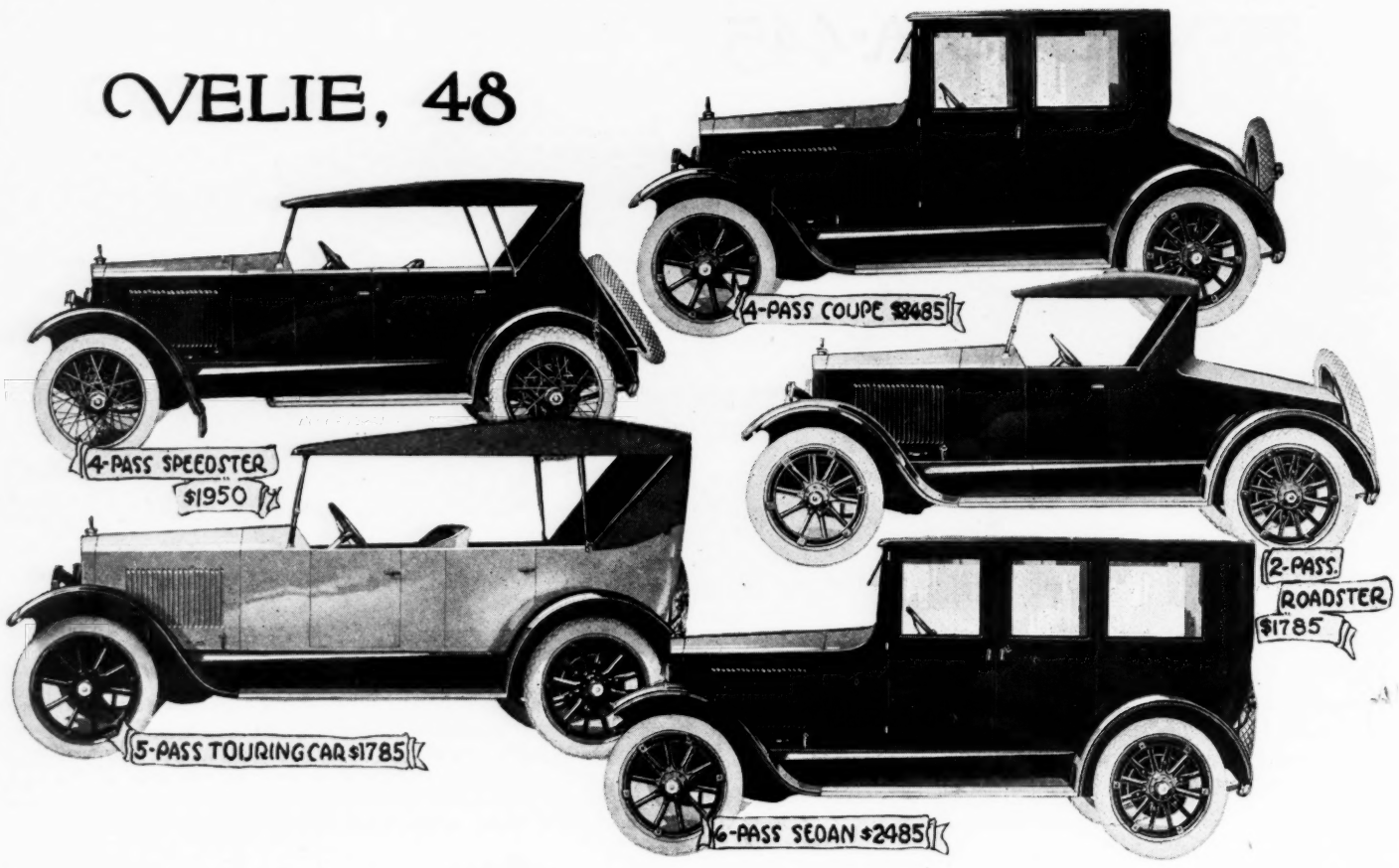
THE Tulsa comes as a five-passenger touring, a two-passenger roadster and an Oil Field roadster. Each car comes with two color options, green and maroon, blue being the stock color. Single ignition from the Connecticut system is used, the motor and generator being of the two unit type and Dyneto make.

WINTHER, 61

SPECIFICATIONS for this car are not available at the present writing other than it will have a six-cylinder engine, said to have developed unusual efficiency in tests. The body is very unique in its simplicity and graceful lines.

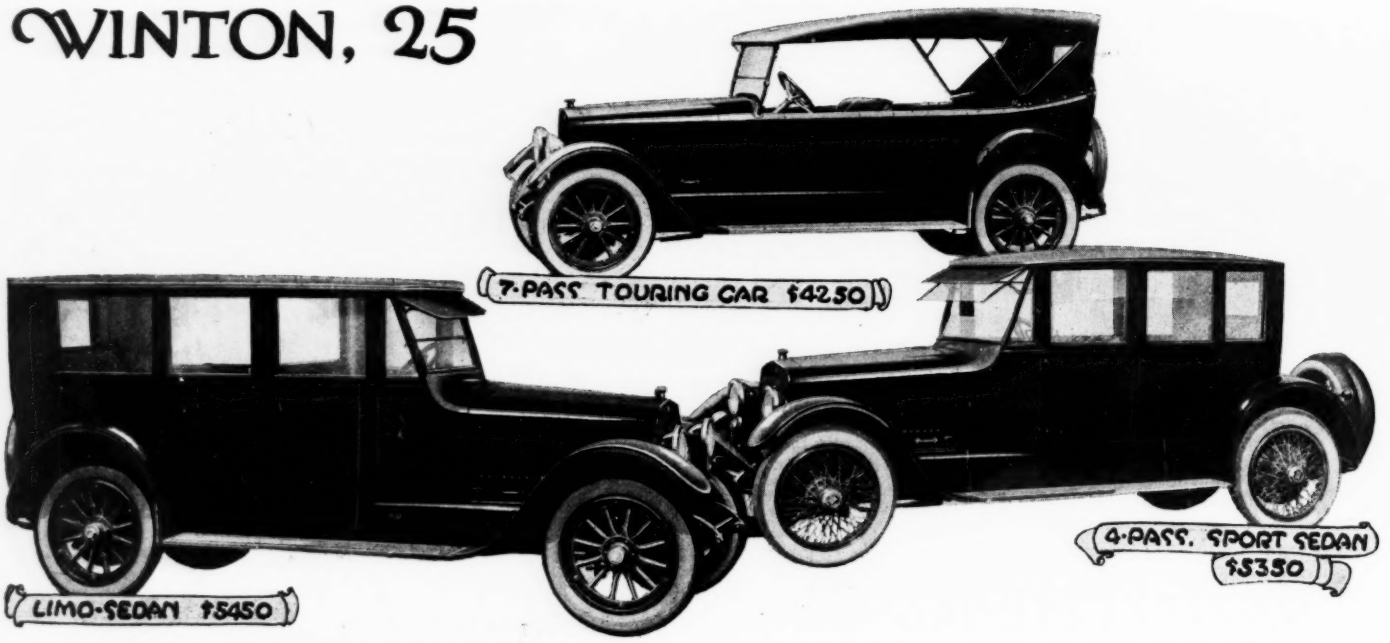


VELIE, 48



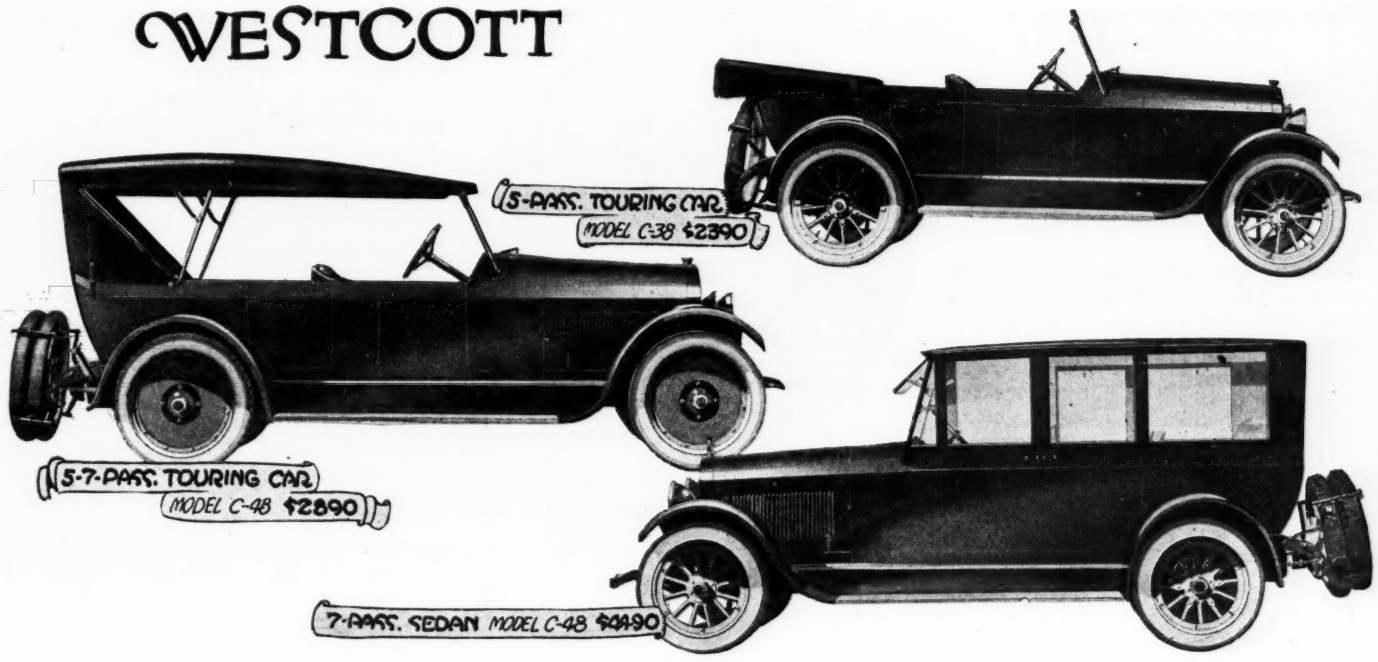
MANY improvements have been made in the new Velie for 1920. A new engine having an internally heated vaporizer capable of burning low-grade fuel and giving more mileage has been adopted. It has a four-bearing crankshaft with bronze-backed bearings everywhere. There are five body styles in the 1920 car, a touring car, two-passenger touring roadster, four-passenger sport model, four-passenger coupe and a six-passenger sedan. The Velie has also announced another entirely new model, the Model 34, a smaller machine than the older cars.

WINTON, 25



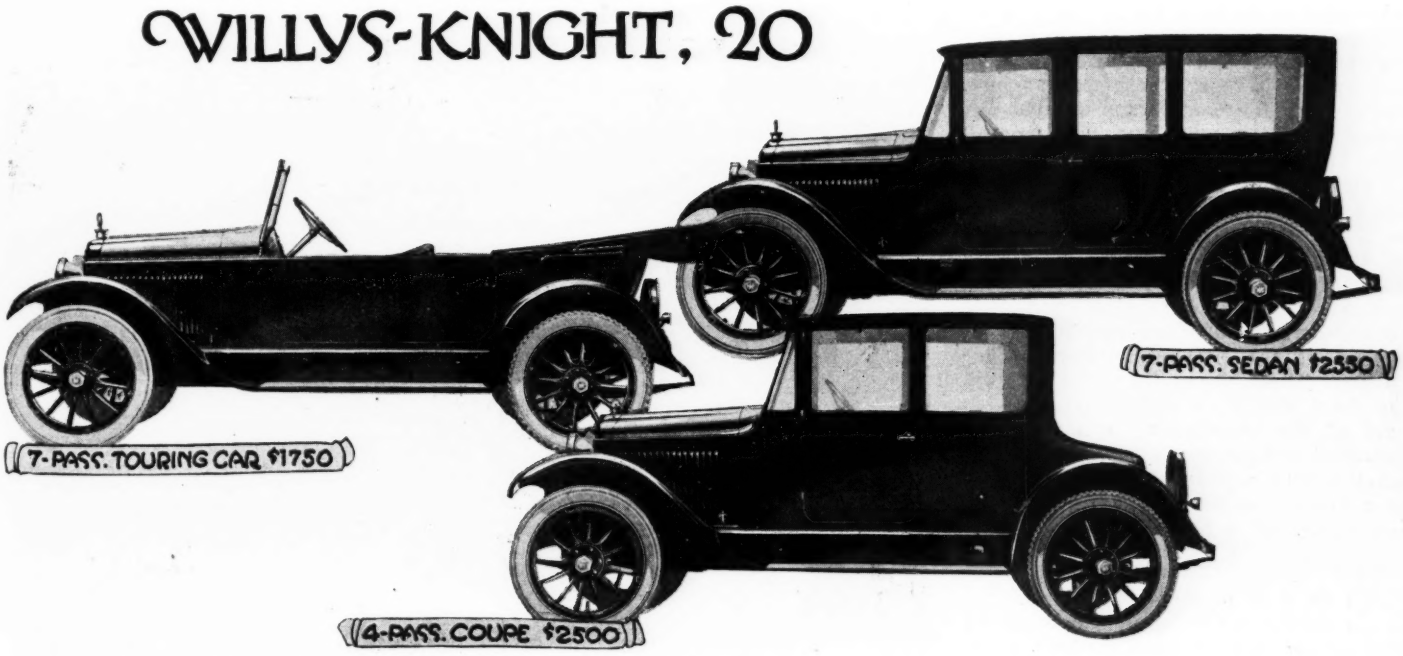
THE important changes on the model 25 Winton which is the light six, consist of the following: The cylinders have been changed so that the heads are detachable, with machined combustion chambers. The heads are aluminum. The size and shape of the inlet manifold has been changed to give better gas distribution and so arranged that maximum amount of heat is obtained at low speed and a lesser amount at high speeds. The side channels on the frame have been increased in depth and tapered from front to rear so that there is no offset in the side rails. Long semi-elliptic springs are used in the rear, hung directly under the side rails. The speedometer drive has been changed to a worm gear mounted directly on the transmission case. There have been other changes in the body design tending to improve the appearance.

WESTCOTT



WESTCOTT shows numerous refinements in this year's models and one of the most important in the body line is that of changing the bevel edge type to a belt line type. This belt line is formed by rolling a bead in the body metal about 4 in. down from the top of the body. The line extends the full length of the car with the hood hinge merging into it. Cowl ventilators have been adopted, these being of cast aluminum. Due to minor changes in the top, windshield and body, the company has adopted Collins curtains. Other changes consist of cord tires in place of fabric, Gabrial snubbers as standard equipment on the larger six, oil lubricated universal joints in place of the grease lubricated type, radiometer, to indicate water temperature and the return to the use of honey-comb radiator. A new double tire carrier has been added, which makes it possible to carry a disk wheel, wire wheel and wood wheel rims with or without tires. No leather straps are used and the wheels can be locked in position. The lamps have been made adjustable and the brake counter shaft has been fitted with anti-rattlers to compensate for wear. The wind shield is tilted to a marked degree.

WILLYS-KNIGHT, 20



REFINEMENTS are the only changes in the Willys-Knight models for 1920, basically the car remains the same, although the shape of the radiator and top edge of body have been altered. The Knight engine has come in for a few refinements in that aluminum pistons have been adopted and the timing gears are driven by a single silent chain running in oil. **The Willys line for this year includes a five-passenger touring,** two-passenger roadster, four-passenger closed model. Thermoid universals are used and a Tillotson carbureter has been designed especially for the sleeve-valve engine in this car. The rear springs are long cantilevers and the riding qualities of the car have been improved by the use of deep upholstery **with cushions set at an angle.**

WHAT THE CHICAGO SHOW OFFERED

(*Continued from page* 13)

its maintenance is the use of cable for the service pedal. The cable runs through a housing, consequently is not exposed to water or mud and has an equalizing device on the pedal, which automatically takes care of the brake wear.

Regarding the use of cross members, mention might be made of the method used by Briscoe at the rear of its engine. A single pressed steel member runs across the car and acts not only as running board supports, but carries the engine at the rear, the latter being bolted directly to it. There is plenty of space between the engine arms and frame so that the power plant readily can be slipped from the frame without disturbing other units. It affords plenty of room of the parts are out of sight, sides none of the parts are out of sight, as is sometimes the case where the engine holding down bolts are put on the inside of the frame side rails.

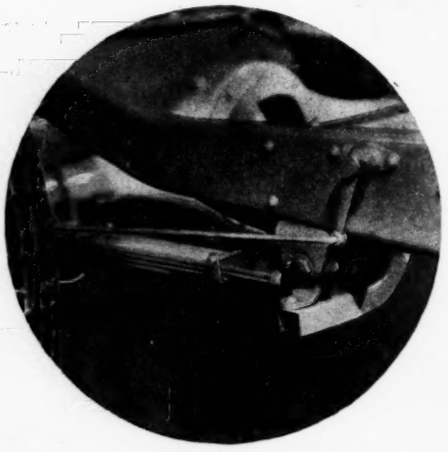
Think From Service Standpoint.

In the early days of motor car construction the maker built his cars to suit his own fancies regardless of accessibility. Often a good design was marred from the fact that certain repair or service jobs were too hard to perform. Nowadays the maker thinks of the service man. Take the new Saxon and Monroe. These cars use a type of frame similar to Marmon, with the double cross springs on the rear. With the gasoline tanks on the rear of cars as is the case here, it would be practically impossble to perform the job of graphiting the springs, owing to the little room between tank and springs or springs and axle. However, these makers have cleverly arranged the cars so that the bottoms of the rear seat and tonneau floor boards come out, and thus make it a very simple matter to get at the springs. In fact they can be gotten at in a far more comfortable position than on most cars.

Some cars using Hotchkiss drive have experienced trouble in the front rear spring shackle bolt wearing, due to distortion of the bracket supporting the spring. There are quite a few cars at the show that show refinements on this part of the chassis and generally the improved method consists of bracing the bracket with a channel section member to a cross member of the frame. The new Cleveland is an example of this.

Service Equipment is Shown.

And so it is possible to go from car to car or chassis to chassis and see in what manner maintenance has been given thought. A trip through the accessory exhibits show how the kindred industries have kept pace with the service question. In former years it was not so common to see crankshaft bearing aligning tools, burning-in stands, electric testing devices and all the other apparatus used in a well-equipped shop today for speeding up repairs, but at the shows this year exhibits of service equipment forms a large part of the accessories displays.



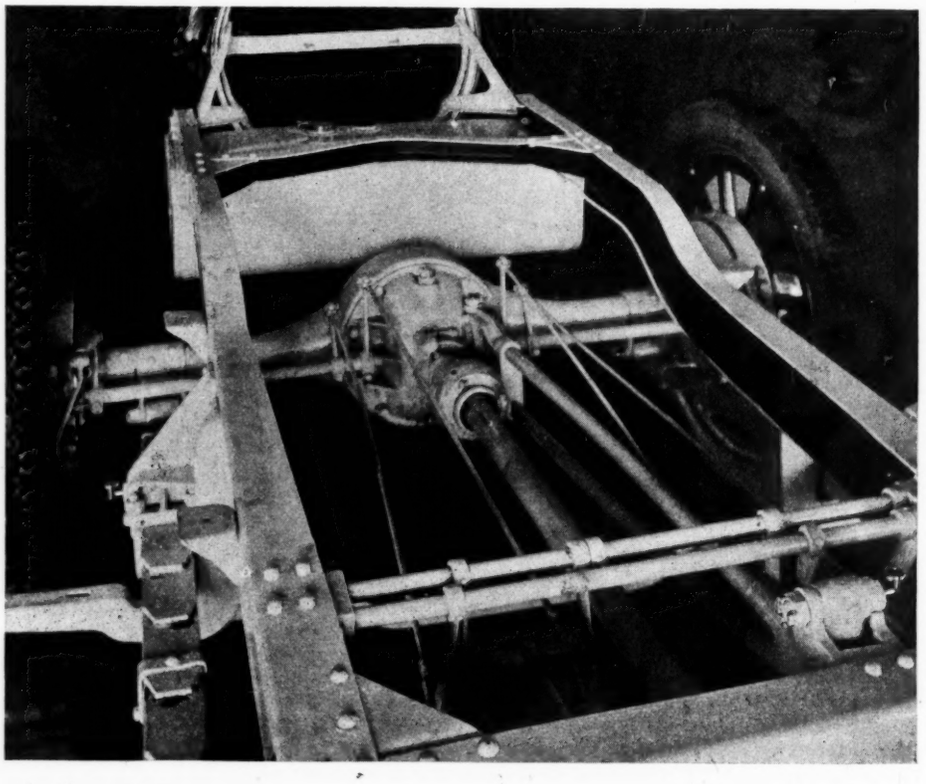
How the rear spring bracket on the new Cleveland is supported by a brace from cross member

The shows, of course, set the fashions for the automotive industry and this year's Chicago affair is no exception. In all there are eighty-four makes of passenger cars represented, while the balconies are housing 164 accessory exhibits. The decoration scheme thus surpasses the former attempts, because there is far more light for one thing and the exhibits are hidden by a lot of decorative material that in no way enhances the value of the exhibits. The ceiling of the Coliseum is hidden by an enormous sky piece in green, white and gold, while the decorations under the balcony are blue and green, the patterns being worked out from the pottery of the Hopi Indians. In fact the whole show has the atmosphere of the Indian element. The main floor is divided into four big sections with each section identical. As is always the custom at the shows the center sections are occupied by the big production companies including Dodge Brothers, Studebaker, Chevrolet and Overland.

There are many new designs of body and chassis, these having been accomplisher in spite of the fact that makers throughout the industry have been concentrating on production rather than on changes in designs. Those makers who had new models at New York naturally showed them at Chicago and among these was the new Nash Four, Studebaker, Marmon, Allen, and others. Every pocketbook and individual taste of purchaser can be satisfied by the varied priced and types of cars exhibited. There are cars shown ranging from $750 to $10,000, the latter being the Victoria Four-passenger Packard finished in maroon. This without question was the highest example of motor car achievements that has ever been shown at the show.

Salon Well Attended.

The Automobile Salon, which was held at the Congress hotel contemporaneously with the passenger car show at the Coliseum, attracted good crowds on Sunday when the larger show was closed. For the most part, this show is restricted to the higher priced American made cars, only one French car being shown.



Here is shown the type of chassis layout that is loosing ground because of the multiplicity of parts and grease cups, which only collect dirt and are forgotten



A general view of the Chicago Truck Show

Chicago Truck Show a Great Display Of a Great Industry

Pneumatic Tires One of the Most Prominent Developments

Impressions of Chicago Truck Show

¶ Exhibits show the tremendous and swift growth of the industry.
¶ Location of show is far better than its New York predecessor.
¶ Building is attractive and well suited for exhibit of this character.
¶ Parade is excellent idea as a publicity getter for venture.
¶ Truck Owner's Conference chiefly valuable as publicity getter.

CHICAGO, Jan. 24 — The National Motor Truck show which opened yesterday afternoon in the International Amphitheatre at the Union Stock Yards, is, like the recent New York show of trucks, a wonderful display of the products of a comparatively new industry.

Not until the industry's trucks were assembled under one roof had it been possible for one to observe the strides which have been made in this newer line of automotive manufacture. That trucks have been increasing in number was a fact of which the public and trade had been aware, but that the product of the industry had reached a state of such development is surprising to most of those who see the display for the first time.

Probably the biggest factor of interest for the average man in the show is the pneumatic tire equipment on the big trucks. Some of these tires are 12 in. in diameter, more are 10 in. and then, as the sizes become smaller the number becomes larger.

Things the average man wants to know are how a driver can change a tire on the road if he has a blow-out. This sort of occurrence is frequent enough to merit consideration. The problem is a hard one, for the big tires are tremendously heavy. A 37 by 5 in. tire is heavy enough, and a 12-in is almost too heavy for two men. How this problem will be solved in the future will be interesting. Also, trucks of some makes will have to be redesigned to stand up under the higher speeds which will be possible with pneumatic equipment.

There are about sixty-five exhibitors of trucks, and each of them shows from

one to a half dozen vehicles. The chasses are in most cases fitted with bodies, all of which makes the display impressive to the man who takes the trouble to go all the way out to the stockyards to see the exhibition.

This array of bodies is one of the effective features of the show. It brings home to the spectator the fact that the motor truck has made good in a great variety of businesses and can be fitted to all sorts of systems of transportation. On one chassis will be seen a big van body, on another an omnibus, on another an oil tank body, on another stake, express and platform types, but from it all one gathers the impression that the motor truck manufacturer and dealer has become an expert in fitting the truck to the needs of the man who buys it. Many of the bodies are special adaptations for the particular needs of some business field, and the bright colors and big firm names on the apparatus are a great selling argument for the industry as a whole.

Better Than New York

Of course, for the man who does not see the truck show this week it is not going to be easy to tell the story so he will have an adequate conception of the enterprise as a whole. However, let us go back to the beginning and give the story of how a visitor to Chicago gets to the truck show and what he sees after he gets there. And before we do that it might be well to go back a bit and say a word about the New York truck show.

The man who went to the New York truck show will be rather agreeably surprised with his trip to the Chicago show. New York's show was in the Bronx, and the Bronx is about as far from Manhattan, to the mind of the New Yorker, as it is possible for one part of a big city to be from another. Many prospects refused to go to the New York show, which they said was in "South Albany." It was a long ride, about 45 minutes, from Forty-second street to the New York truck show, and it seemed longer because the New York man is not in the habit of going there. There is nothing in the Bronx which ever draws the New York business man to this northern borough of the city, and it exists in his mind as a great expanse of houses, apartments, vacant lots "and everything," a long, long way from "civilization."

Wherefore, all New York was, at the mere mention of the location, prejudiced against going that far. Of course, if a man would once get on the subway or "L" and make the trip, it was not as far as it seemed, but there was a psychological objection to the show because of its location, and this hurt the attendance.

This distant location was taken because the Bronx contained an armory with an enormous floor. Similarly, the Chicago show is held at the stock yards because it was the only place where could be found a building that would provide what seemed to be adequate floor space.

The building being used is the International Amphitheatre, an enormous structure commensurate with the wide areas that prevail in Chicago. There is a big central auditorium, surrounded by a gallery on which has been built a mezzanine floor, and extending from the sides of the auditorium are several side rooms, with comparatively low ceilings, in which there are many square feet of floor.

This building was erected ten or fifteen years ago principally to provide space for live stock shows. It has since been used for various expositions and for great mass meetings. Roosevelt, Taft and others have addressed great meetings in the big auditorium. This has nothing to do with the truck show except that it means that the people of Chicago and vicinity are in the habit of going out to the stock yards section, distant as it may be. When the location is mentioned people do not have to wonder where it is. Most of them have been there once at least and most of them several times. This has removed at the beginning that prejudice against the location which existed in the case of the show in the Bronx.

Trip Is a Short One

Actually, also, it is not as far out to the stock yards as it was from 42d street to the Bronx. The trip takes about two-thirds the time it took to go to the Bronx show. Transit facilities on the opening day were not all that might be desired, but they may be improved before the week is over.

To get to the Chicago truck show the visitor takes an elevated train in the loop, changes cars once and lands about two not very long blocks from the Amphitheater. After a short walk toward the big sign on the building he enters the door and is at once struck with the great array described earlier in the story.

The auditorium of the Amphitheatre has been covered over in a high arch with a false ceiling of cloth. In the center are a number of large clusters of lights, throwing a strong illumination over the whole display. Then, as the visitor walks about he sees trucks and trucks and truck, and here and there, under the balcony and upon it, he finds accessories, equipment and parts, which impress him with the fact that the industry and its products are permanent and destined to grow, for accessories and parts do not attach themselves to industries that have not the possibility of permanence and expansion.

The trucks shown are of a wide range. There are little delivery wagons, medium sized vehicles and great leviathans that look as formidable as locomotives. Throughout the display are cut-away parts and chasses, showing the visitor what's what inside.

When the management conceived the idea of holding these truck shows at these distant locations it realized that there must be a large amount of publicity and promotion if an adequate crowd was to be secured. Even with this, the attendance at the New York York truck show and the results secured were such that it is generally considered as pretty much of a fizzle. There are indications that better results may be secured from the Chicago show. It is almost impossible to make any estimate of probable results at this early date in the week. But the affair on its opening night has a better "feel" than did the New York show. For one thing, the building is warm, whereas New York's truck show building never did get comfortable all the week.

Parade Opens Show

As a starter in the week's promotion of the show a big truck parade was held this afternoon. In all there were 2215 trucks, borrowed from numerous fleet owners in Chicago. The parade started from four different points in four different sections and finally all came together in one mammoth parade, which went out through the stock yards section and by the show building. Because of the length of the parade it could not all pass through the congested downtown district. One division, with about 500 trucks, went through the loop and gave the show a lot of publicity.

The other publicity feature, as at New York, is the Highway Transport Conference. This is a series of meetings of an educational nature held afternoon and evening in an assembly hall in the Amphitheatre. The hall is about like any other hall, having a stage, seats, etc. One bad feature is that there is a sky light, which will prevent moving pictures during the afternoon unless the light is covered. To date, however, the skylight is still skylighting and is anything but an essential.

The program of these meetings is divided into two parts. The afternoon meetings are for people in the trade, for dealers, salesmen and others. The evening meetings are for people who buy and use trucks. Men from various lines of activity have been secured to speak on a wide range of subjects and time is allowed for discussion. The affair is managed by John Eustis, who managed the New York conference. At intervals educational motion pictures are run in, showing various phases of manufacture and maintenance.

The program was supposed to have begun the opening day of the show, but the assembly hall was not even cleaned out by evening, the floor was dirty and covered with sweepers' sawdust, and there was no meeting at all. Even had there been a meeting it is doubtful if there would have been much of a crowd, because the attendance was small.

The same condition which prevails at the conference here existed in New York.

Trucks Making Chicago Debut



CHICAGO'S Truck Show, for the first time held in conjunction with the passenger car show, is the greatest exhibition of commercial vehicles that has ever been shown in the middle west. Attendance, despite the fact that the location of the exhibit is rather at a distance from the center of the city, is greater than was anticipated, and the number of dealers in attendance was particularly gratifying to the exhibitors.

3½-Ton Models Gaining

Two important factors have had much to do with the presentation of the new trucks. One is the highly noticeable trend toward pneumatics and the other is the influence of the "ship-by-truck" movement on the size and design of the trucks. Sixty-six different makes of trucks, exhibiting 214 chassis models and ten more exhibits still missing due to railroad transit delays comprise the whole offering at the show. Thirteen new models of trucks are shown, which include the new four-cylinder Auto-Car of 3½ ton capacity; ¾-ton Bethlehem; Federal 1-tonner on pneumatics; Graham Bros. 1½-ton; 3½-ton I. H. C.; 3-ton Packard, designed for pneumatics; Stewart 1-tonner; Ace 1½ and 2½-tonners; 1¼ and 3½-ton Garfords; 5-ton Schacht; and 3½-ton Sheldon.

For transit work, the 3½-ton truck is gaining wide popularity. This size seems to be best adapted for truck transport work, and this no doubt accounts for the reason that so many companies are exhibiting this size truck.

One of the big new things along this line of development is the 3½-ton four-cylinder Auto Car exhibit. This is a heavy duty truck with a vertical four-cylinder engine which is a new development for this company in the engine line and also in the matter of capacity. 29.6 hp. is the rated output of the engine. The list price of the chassis is $4,100. Autocar practice is adhered to, in that the engine is located under the seat. It is equipped with solid tires all around, gas headlights and tank and with oil taillight. **The wheel base of this job is 120 in. and the tread 63 in.**

High Spots of Truck Exhibits

119 of the 224 chassis models equipped with pneumatic tires. A trend toward the 3½-ton truck as being most universal in its application.

Power tire pumps almost universal in equipment, or else provision for application of pump to transmission.

Lubrication receiving better attention. The Alemite system gaining great popularity because of its high pressure forcing characteristics.

Application of refrigerator body to truck chassis.

The largest tire on exhibition is a 48 by 12 in.



One of the best merchandising exhibits at the Chicago Truck Show is the large pneumatic tire, 48 by 12 in., mounted on the 5-ton Master chassis. This is the largest pneumatic tire on display at the show

The new 3-ton Packard, equipped with a 5-ton engine, to provide the extra power made necessary because the truck is equipped with pneumatic tires, which allows of greater operating speed. The new model has a wheelbase of 156 in., the price with this size being $5,500, and for the larger size, having a wheelbase of 186 in., the price is $5,575. These prices include a power take off and a Kellogg power tire pump, that is driven from the transmission.

The I. H. C. now boasts of a 3½-ton job also. This is the largest size truck made by this company. This truck has the same sized engine as the 2-ton model differing only in wheelbase, the tire size, the number of speeds in the transmission, and the rear axle reduction ratio.

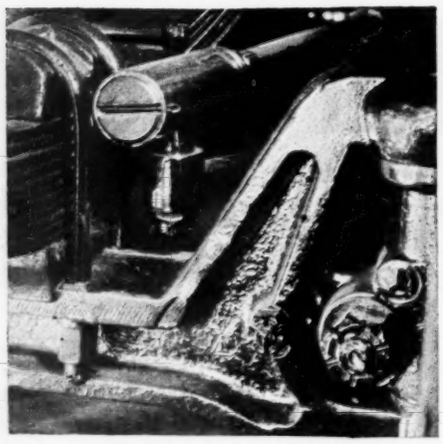
Garford Has Two Trucks

The Garford line now includes two new trucks, one being of the popular 3½ ton size, and the other is a small job of 1¼ ton capacity. To those familiar with the Garford line this announcement will come as a matter of surprise, no doubt, for this company already has represented in its line another 3½-ton model. It is not intended though, that the new model will supplant the old one. Both will be available. The new model having a wheelbase of 162 in., and the older 128 in. The engine of the new model has the four cylinders cast in two blocks. Of the T-head type the measurements are 4¾ by 5½ in.

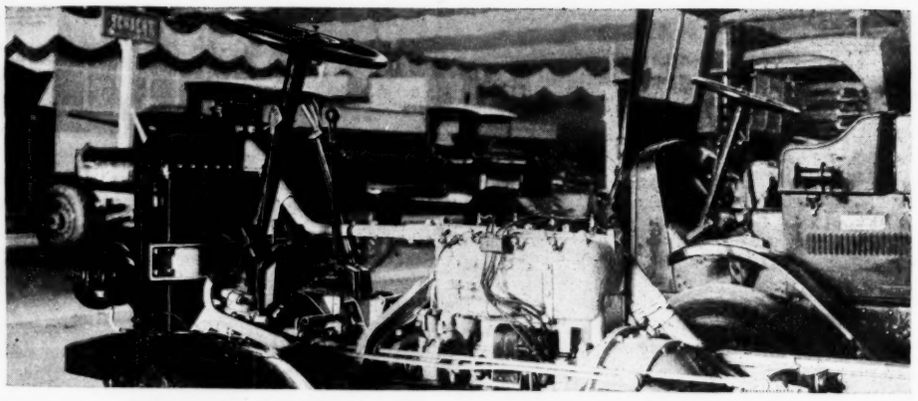
The crankcase is made of two separate castings, the upper half supports the shafts, bearings, gears and cylinder block and also in cases the upper half of the flywheel; the lower half forming an oil reservoir only is easily removable for examination of the bearings. Aluminum is used for both portions of the crankcase. A full force feed oiling system is used. The oil being circulated by a gear driven gear pump. The connecting rod bearings are oiled by drilled passages in the crankshaft.

A feature of this truck that makes it particularly valuable to the man doing excavating work, or other work of similar nature, is that an extremely short turning radius is made possible by locating the engine under the cab. A worm drive rear axle is used, with a bevel type differential.

A new line of heavy duty trucks is that introduced by the Stoughton Wagon Co., of Stoughton, Wis. **The trucks are produced in three models, a 1½-ton, a 2-ton, and 3-ton jobs. All models can**



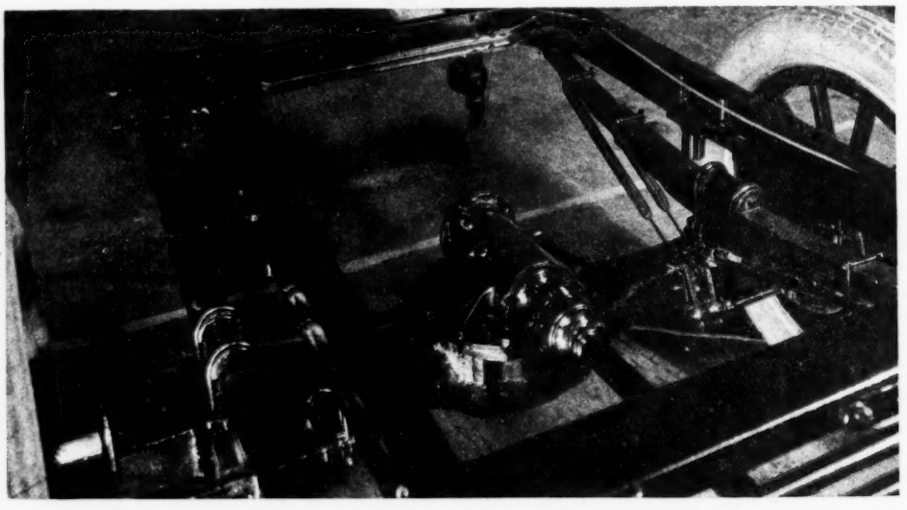
Steering knuckles on the Selden



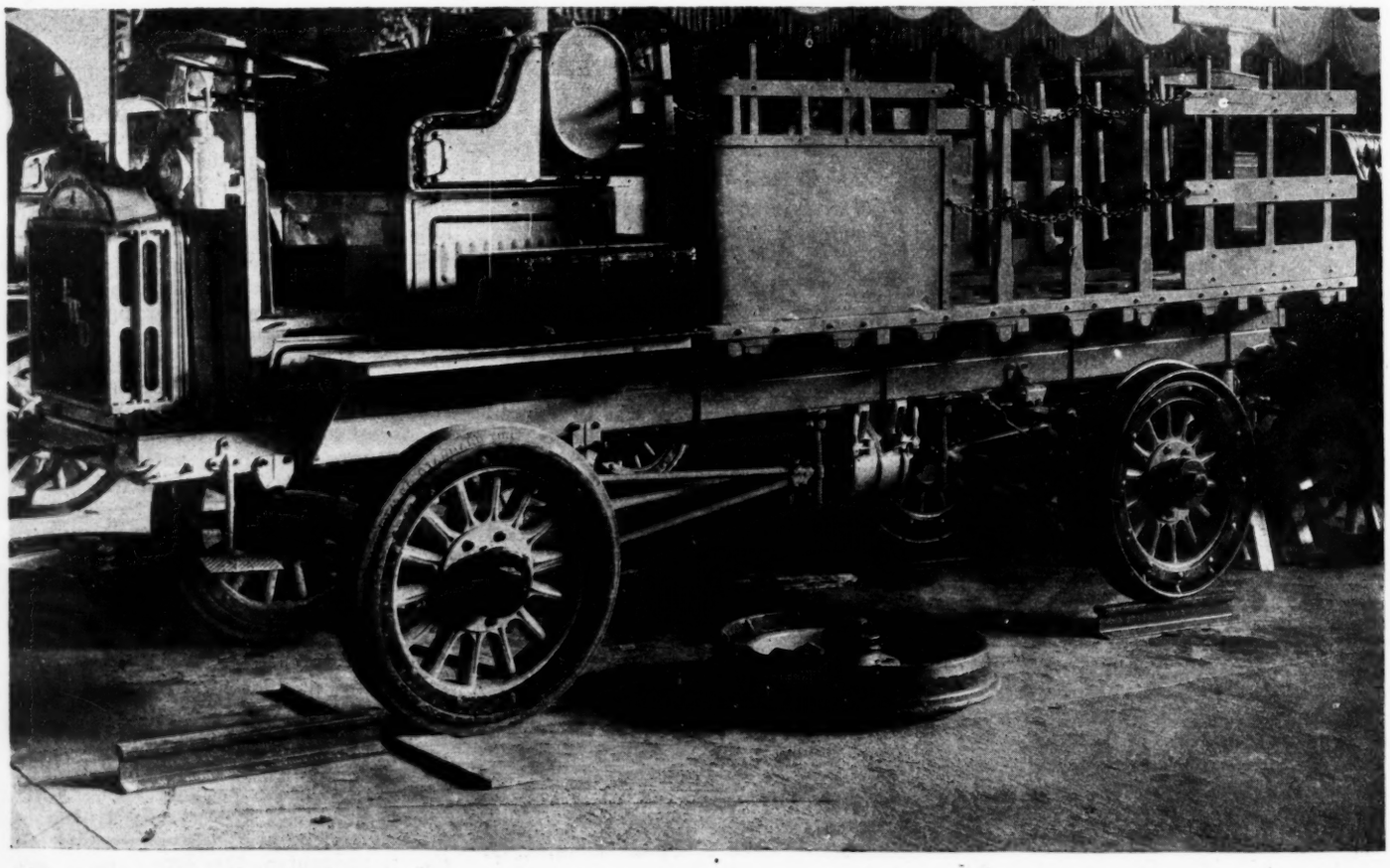
The new four-cylinder 3½-ton Autocar

be had with pneumatic tires if desired.

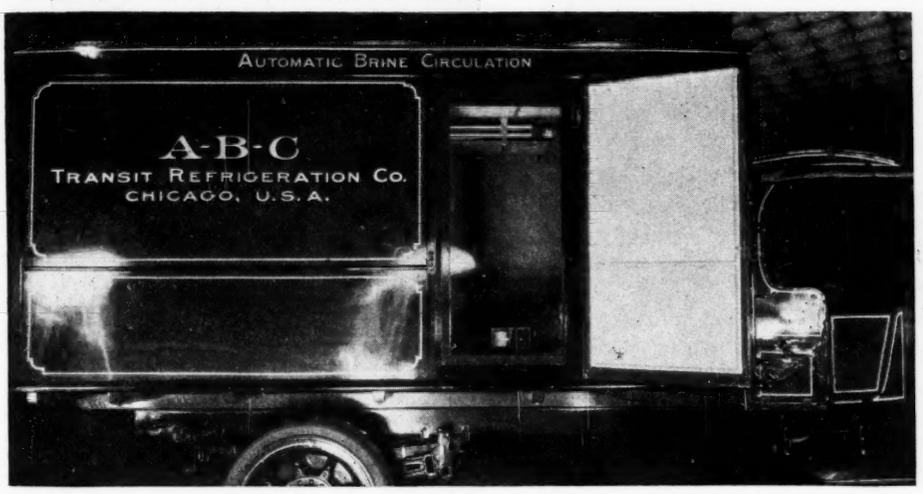
Lack of space necessitates that only one model be described herewith, the two larger models are practically duplicates in increased size of the small model and the popularity of the larger 1½-ton model is the reason for taking it up here. Briefly the truck is an assembled product. It uses a Waukesha four-cylinder engine, model B. U. X., whose bore and stroke is 3¾ by 5¼ in., which gives it an S. A. E. hp. rating of 22.5 hp. Actually, however, the hp. development is considerably in excess of this amount, for the engine produces somewhere in the neighborhood of 55 hp. at its governed speed of 1,200 r.p.m. A block casting is used and the head is removable. The crankcase of the engine is of ..onze, a special copper aluminum alloy



One of the smallest trucks at the show having worm drive. A Vim 2-ton job



An F. W. D. truck bears particular interest because it is equipped so that it can be run on the railroad track with a change



Service chassis with a refrigerator body mounted on it

being used in its construction. The cooling system is of the forced type, the centrifugal pump being driven by the auxiliary drive shaft. A Stromberg, model M carbureter with gravity fed gasoline from a tank under the driver's seat comprises the gasoline system.

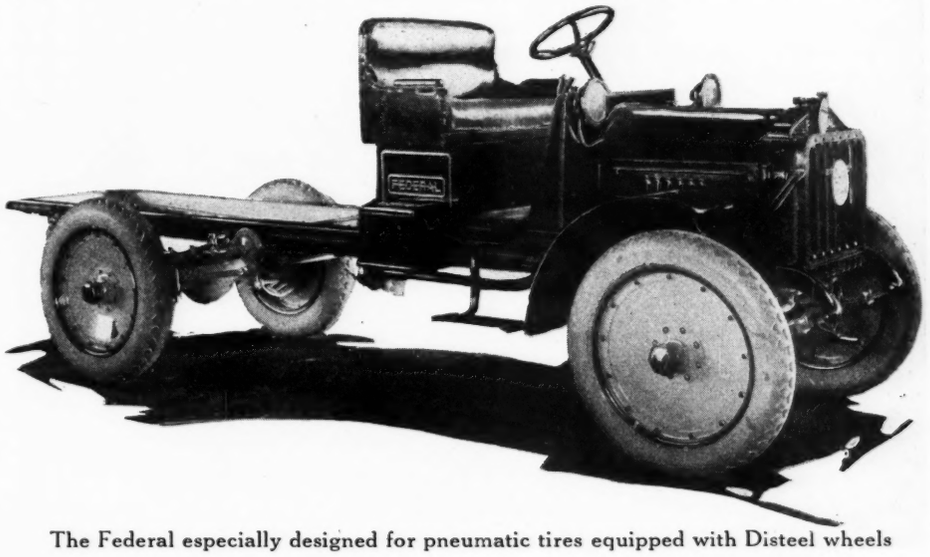
The ignition is by an Eiseman high tension magneto. An adjustable spark is used in preference to the set spark, which experience has shown does not give the greatest efficiency of the engine, because every throttle setting and every change of load really needs a new position for the spark lever. When desired the engine is equipped with a special Eiseman magneto generator which automatically produces enough current for the headlight.

A multiple disk clutch of Brown & Lipe make is in unit with the engine as is the three speed Brown & Lipe transmission.

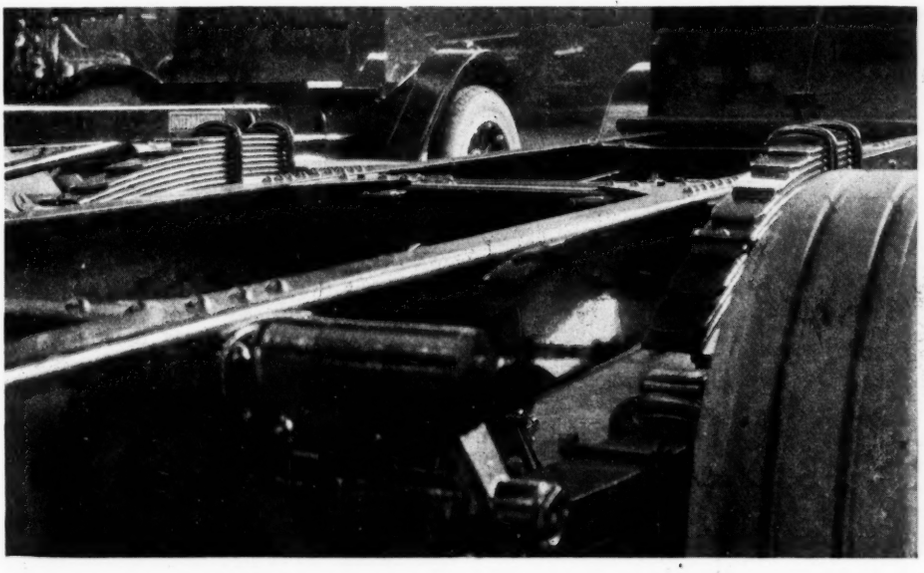
It is particularly interesting to note that the driveshaft of this truck has four Universal joints of the flexible disk type with thermoid Hardy fabric material used for the driving disk. Between the center flexible disks and amidship of the truck frame a Timken roller bearing support is used to prevent road-shocks from being transmitted to the engine and to prevent torsinal vibration of the shaft. Large steel I-section radius rods are used to absorb the driving strains. Thus there is no strain on the spring shackle bolts nor on the propeller shaft. Driving and braking strains are also absorbed by these radius rods which prevent the axle from turning, or tending to turn in its housing.

The frame is a pressed steel channel section of 5½ in. depth and its length is 210 in., which gives a wheelbase of 140½ in., and a loading space of 124 in. back of the driver's cab. The frame is a product of the A. O. Smith Company, of Milwaukee. Extra wide semi-elliptic spring are used on both the front and rear. The rear springs are composed of eleven leaves, each 2½ in. wide by 50 in. long. The front springs are somposed of eight leaves, 2¼ in. wide by 40 in. long. Spring shackle bolts are provided with wick oilers and all shackles and hangers are provided with bronze back bushings.

The rear axle is of Sheldon make. The weight of the axle is carried on the steel housing which is extremely heavy in construction. The worm and the worm wheel are mounted on annular ball bearings and may be removed as a unit from the rear, without removing the axle from the truck. The front axle is also of Sheldon design on which roller bearings are used.



The Federal especially designed for pneumatic tires equipped with Disteel wheels

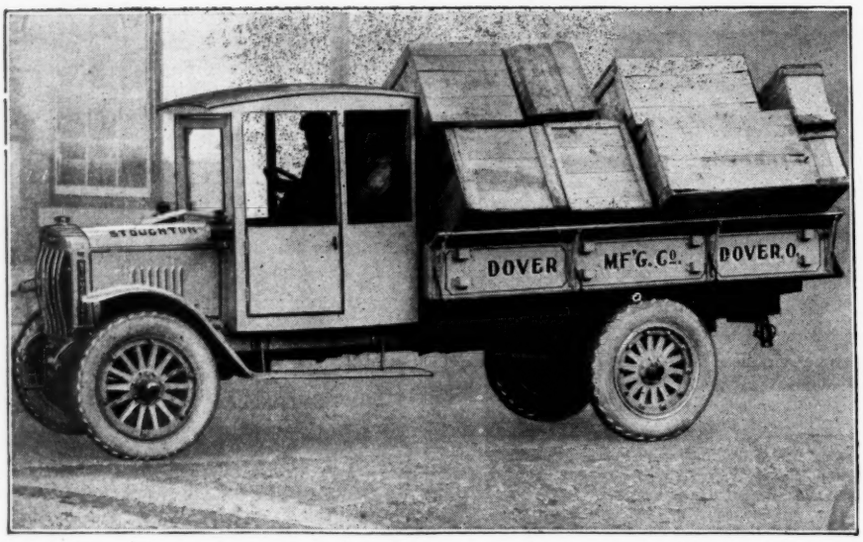


I. H. C. truck, showing strong spring construction

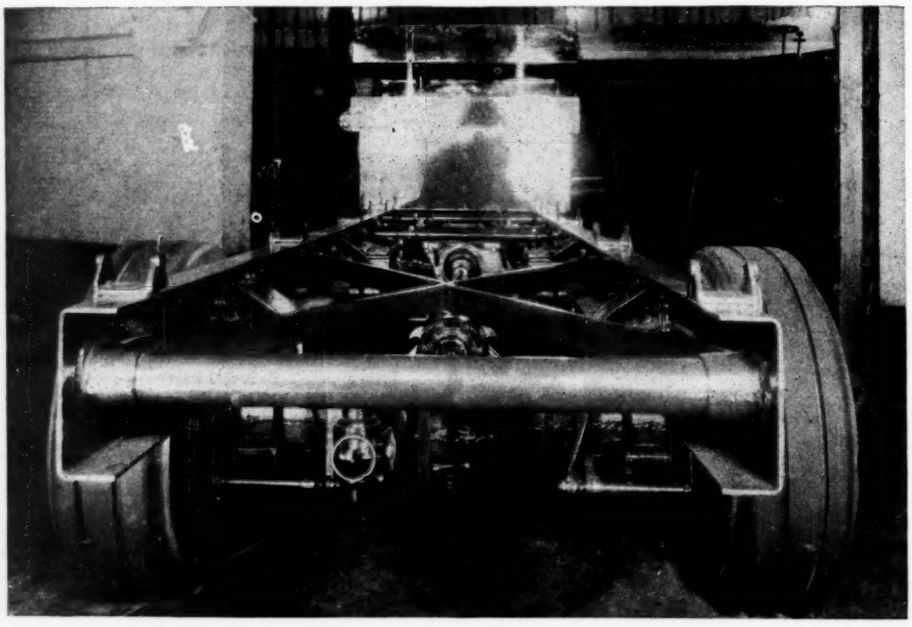
A feature of the brakes is the extreme width of the brake drum. The foot brake is of the internal expanding type. The foot brake and emergency brake bands are each 2¼ in. wide and operate on 18 in. drums. Equalizers are used to insure that the pressure on the drums is the same.

Velie Has New Truck

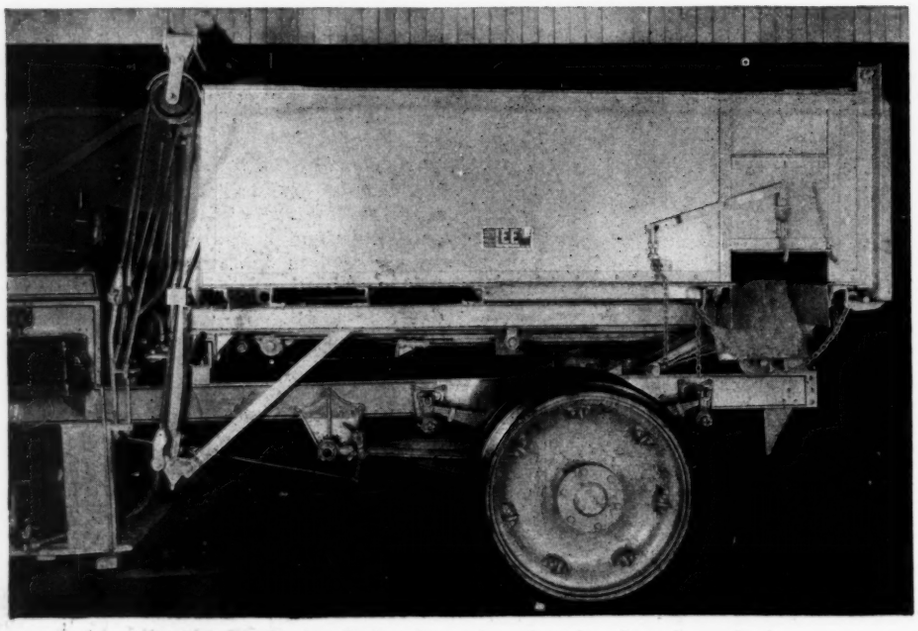
Velie is represented by a new truck of 4,200 lb. capacity. This model is equipped with a Continental model N engine, of 3¾ by 5 in. bore and stroke. The governed speed of this truck of this job is 18 m.p.h. This engine has a force splash lubricating system, the oil being circulated by a plunger pump off the camshaft. Bosch ignition is used. A unit power plant is used, a Borg & Beck clutch and a Durston three-speed trans-



The Stoughton truck equipped with pneumatics



The Selden 5-ton job showing the flexible frame



A 6½-ton Packard chassis equipped with a Lee dump body



The cab of the Paige is equipped with sliding curtains that provide greater comfort for the driver

mission forming the remainder of the unit. Three Arvac universal points are used, with a two piece tubular shaft. The steering gear is of the irreversible type with an 18-in, handwheel. The frame is semi-flexible. All cross members are hot riveted to the frame, thus eliminating the possibility of frame squeaks. Both brakes operate on the rear wheels.

Smaller Garford Makes Debut

The smaller Garford truck that is making its debut is of 1¼ ton capacity. It is a job designed especially for pneumatic tires using 36 by 3½ tire on the front and 36 by 4 on the rear. A four-cylinder L-head engine is used having a bore and stroke 3¾ by 5⅛ in., which gives the engine an S. A. E. rating of 22.5 hp. Standard construction is adhered to using a two-piece crankcase with inclosed flywheel. A multiple dry disk clutch inclosed in a housing secured to the crankcase together with a three-speed transmission forms the remaining parts of the single unit power plant. The final drive is through a worm and worm gear to the floating axle shaft to the rear wheels, the worm is hardened steel mating with a bronze worm wheel. A bevel type differential is used. The road thrust on the wheels is taken directly by the wheel bearings and not transmitted to the differential bearings. The differential carrier also supports the bearings of the worm shaft and makes a unit of the worm, worm gear and differential, and contains all the bearings and adjustments necessary for these parts. The rear axle housing is made up of pressed steel.

Maxwell is represented by a new 1½-ton pneumatic equipped truck. This model is new throughout, having a new engine and a new frame construction. It is built with as few a number of parts as possible. The engine cooling system is by thermo-syphon circulation, thus eliminating the water circulating pump.

(*Continued on page 89*)

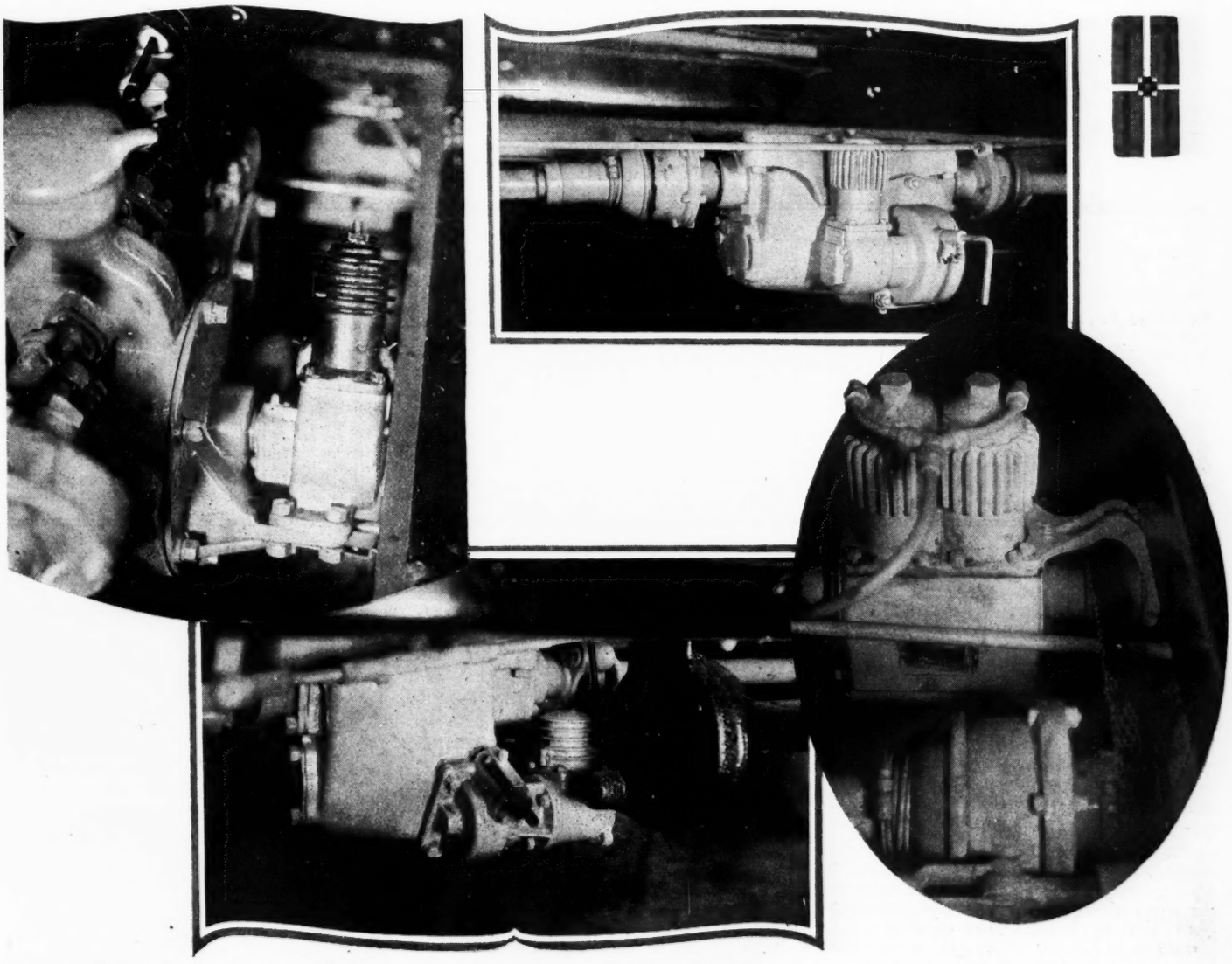
Few Changes Probable in Trucks for Next Few Years

WE cannot expect very many changes in truck design in the future, if we are to judge truck design of the future by the tendencies and the trend of design that is reflected in the new 1920 truck models. There have been a few important changes made in the 1920 trucks, which are direct results of conditions over which the truck manufacturer has no control. For instance, the fuel problem is reflected in new type manifold construction and the ship-by-truck movements throughout the whole country have reflected in the truck design better transmission apparatus and an increased use of pneumatic tires. Like in the motor car field the price of the truck models for 1920 has increased, but the increase in truck price is not at all in proportion with the increase of passenger car prices. For example, an increase of 4.3 per cent is the average price elevation on all truck models.

Average design cannot help but go hand in hand with the tendencies and trend of design. It is found in the truck lines that because of the lack of one dominating truck of a certain size model and standardization of other units that there is no truck which bears the same relation to the transportation field that the Ford car bears to the passenger car field. For that reason a basis of comparison can conveniently be formed from the production estimates, as well as a comparison based on a study of chassis models.

One of the biggest changes which is noticeable in trucks ranging from two to five-ton capacity is that four speed gear boxes are becoming more and more universal in their application. Of course, pneumatic tires are being used more extensively than before and it is probably true that the future will see a greatly increased use of pneumatic tires. The Ford worm driven one-tonner is at present equipped with solid tires on the rear. There is a possibility though, that solid tires will be replaced with pneumatics.

Classifying the various trucks into capacity divisions we find that there is a strict and almost rigid adherence to certain types of final drive, that is, in the ½-ton truck bevel gears are used for the final drive. In the ¾-ton truck internal gear is used for the final drive, and upwards in capacity worm drive is general. Another change which is slight is that the 3½-ton trucks are now driven



Showing different methods of mounting the power tire pumps made necessary by the use of large pneumatic tires for trucks

through the springs instead of the radius rods as was the case in 1919.

The fuel question is one of absorbing interest in the commercial field as in the passenger car field. It is interesting to note that especial attention is being paid toward more perfect carburetion through the attainment of better constuction in the manifolds. Hot spots and manifolds wherein the heat is transferred directly to the intake manifold from an exhaust gas heated wall which is common to both manifolds will undoubtedly be used by the majority during the next coming years. Manifolds where the heat transference is from a water jacketed manifold are to be seen on quite a number of trucks now, but it is doubted very much whether this type of construction will give sufficient heat in the future if the decline in the gravity of the fuel is at all in proportion with the rate of decline now. The hot spotting system that was in use on the class B trucks for governmental purposes is being copied by a number of makers, on trucks of similar capacity and even on trucks of smaller capacity, this type of hot spot is to be seen. We no doubt are going to receive great benefit from the meeting that was held late in 1919 by the fuel producers and the engine designers, where the common difficulties of the two classes were discussed.

Electric equipment seems to be in the stage that was reached several years ago by the motor car makers, when starting and lighting was offered as "something extra." There are six models of ½-ton trucks offered, and all of the six are equipped with electric starting and lighting. For quick light delivery work, this may be interpreted as a trend that will be reflected in all future designs. Electric lighting though may be expected to be in general use on all trucks regardless of capacity.

A careful study of trend in load capacity and in price of the trucks over an eight year period is shown below in the tabulated columns.

The Trend in Load Capacity

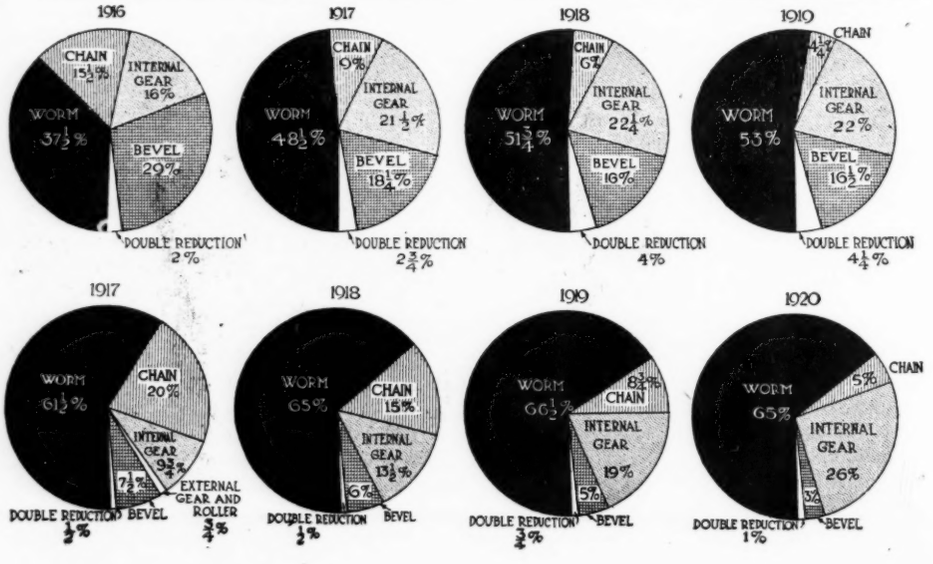
Tons	NUMBER OF CHASSIS								1920 GAIN-LOSS		7 YEARS' GAIN-LOSS	
	1913	1914	1915	1916	1917	1918	1919	1920	*Number*	*Per Cent*	Number	Per Cent
Less than ½	13	15	19	8	3	4	1	1	*÷ 0*	*÷ 0*	—12	— 92.4
½	19	28	31	28	19	13	14	6	*— 8*	*—57.2*	—13	— 68.5
¾	47	48	44	40	23	26	18	12	*— 6*	*—33.3*	—35	— 74.5
1	59	72	68	65	54	64	68	47	*—21*	*—30.9*	—12	— 20.7
1½	46	50	66	54	45	51	75	90	*+15*	*+20.0*	+44	+ 95.6
2	62	62	76	93	70	87	89	73	*—16*	*—18.1*	+11	+ 17.8
2½	5	10	19	17	29	34	41	62	*+21*	*+51.2*	+57	+1140.0
3	55	48	43	33	20	21	17	12	*— 5*	*—29.4*	—43	— 78.2
3½	14	14	28	38	48	64	62	67	*+ 5*	*+ 8.1*	+53	+ 378.0
4	19	17	16	14	12	11	11	10	*— 1*	*—9.1*	— 9	— 47.4
5 and 5½	49	44	45	43	42	52	59	60	*+ 1*	*+1.7*	+11	+ 22.5
6 and 6½	9	16	18	14	9	10	8	6	*— 2*	*—25.0*	— 3	— 33.3
7 and over	6	8	12	10	7	9	6	4	*— 2*	*—33.3*	— 2	— 33.3
Tractors	....	....	....	12	8	16	18	9	*— 9*	*—50.0*	.....	.....
Total	403	432	485	469	389	452	487	459	.....	.....	.....	.....

The Trend in List Prices

Tons	AVERAGE PRICES								1920 GAIN-LOSS		7 YEARS' GAIN-LOSS	
	1913	1914	1915	1916	1917	1918	1919	1920	*Amount*	*Per Cent*	Amount	Per Cent
Less than ½	—	.....	$ 439.50	$ 429.17	$ 503.33	$ 612.50	$ 835.00	$ 320.00	*— 515.00*	*—61.7*	.....	.....
½	$1,527.77	$1,002.00	862.77	766.43	760.59	836.82	934.16	992.50	*+ 58.34*	*+ 6.3*	—$535.27	—35.0
¾	1,358.33	1,453.16	1,328.99	1,234.00	1,217.73	1,227.71	1,390.93	1,453.63	*+ 62.70*	*+ 4.5*	+ 95.30	+ 7.0
1	1,759.39	1,690.55	1,660.98	1,642.17	1,521.50	1,611.80	1,815.08	1,799.49	*— 15.59*	*— 0.9*	+ 40.10	+ 2.3
1½	2,345.53	2,034.33	2,057.54	2,004.32	1,950.34	2,137.19	2,224.60	2,226.21	*+ 41.61*	*+ 1.8*	— 79.32	— 3.4
2	2,635.36	2,565.48	2,433.27	2,287.93	2,302.91	2,504.42	2,758.33	2,809.21	*+ 50.88*	*+ 1.9*	+ 173.85	+ 6.6
2½	2,950.00	2,957.14	2,740.00	2,481.21	2,526.60	2,724.68	2,950.40	3,020.00	*+ 69.60*	*+ 2.4*	+ 70.00	+ 2.4
3	3,095.88	3,323.33	3,271.32	3,147.73	3,356.21	3,368.75	3,688.84	4,147.73	*+ 458.89*	*+12.4*	+1051.85	+34.0
3½	3,837.50	3,437.50	3,489.77	3,276.43	3,258.33	3,480.00	3,904.82	3,999.40	*+ 94.58*	*+ 2.4*	+ 161.90	+ 4.2
4	3,841.66	3,877.77	3,337.50	3,417.50	3,488.63	3,856.82	4,177.77	4,453.89	*+ 276.12*	*+ 6.6*	+ 612.23	+15.9
5 and 5½	4,366.66	4,350.00	4,312.90	4,311.36	4,181.08	4,506.52	4,848.72	4,962.85	*+ 114.13*	*+ 2.4*	+ 596.19	+13.7
6 and 6½	4,970.00	4,743.75	4,915.38	4,555.55	4,725.00	4,925.00	5,237.50	5,360.00	*+ 122.50*	*+ 2.1*	+ 390.00	+ 7.9
7 and over	5,600.00	4,420.00	4,394.44	4,687.50	4,825.00	5,056.25	5,600.00	6,000.00	*+ 400.00*	*+ 7.1*	+ 400.00	+ 7.2
Tractors	.....	.....	.....	3,825.00	3,862.50	3,526.66	3,560.00	4,365.63	*+ 805.63*	*+22.6*	.....	.....

The averages at right are calculated separately on each year's production. The 1916 production was 98,000 trucks; 190,000 in 1917 and 250,000 in 1918. Thus, while the percentage of bevel-driven trucks decreased 2¼ per cent in 1918, there were actually more bevel-driven trucks made in 1918 than in 1917. The estimated 1919 production at this time is 307,000. The approximate number of trucks with each particular type of final drive may be determined for any one of the four years by multiplying the production of the year by the different percentages for that year, as shown above.

The final drive averages shown are calculated on the number of models offered in each particular year. The averages must not be confused with those on the same subject based on the production of trucks. The percentages indicate the decline in the chain drive for some form of inclosed drive.



THE TREND OF TRACTOR DESIGN

BY FRED M. LOOMIS
(Motor Age Editorial Staff)

WHILE the tractor shows which are to come will show a number of new models, there is really little that is new in the way of design. That is, none of the new machines show any radical departure from the principles which characterized the tractors of 1919. Like the motor car, there is an evident tendency toward better manufacture. The new tractors show refinements and better materials. Tractors in the field during the last two years have developed their weak spots and manufacturers have been correcting these rather than trying to bring out anything new in the way of design.

During the year just past there has been a practical elimination of the 3-wheel type tractor and practically all wheel tractors now on the market conform to the 4-wheel design. Manufacturers found a prejudice against the 3-wheel type which increased the selling resistance to a point where it overbalanced any advantage the 3-wheel idea may have had, if, indeed, it ever had any.

Vertical Type Engine Predominates

Nothing has occurred during the year to settle the question as to whether the horizontal type engine or the vertical type will be the lasting engine in the tractor field. All of the horizontal type tractors which were in the market a year ago still are going strong and there is not even an intimation that any of the manufacturers committed to the type of tractor contemplate making a change. Of course, the vertical type engine predominates, principally because more tractors numerically have been built with that type engine than for any other reason. That is, with the exception of one concern, all the companies with the largest production use the vertical type engine and thus it appears to have the supremacy.

The greater sales opportunities for a tractor of about 3-plow capacity as compared with tractors of larger size is probably the reason why some concerns which hitherto have built preponderantly the larger sizes are in the field this year with smaller machines. There is still a place, of course, for the big tractor, but that place does not show a demand at all commensurate with the demand for the smaller machines.

The present indications are that there will be a marked increase in the demand for small tractors during the coming year. There are a number of small tractors on the market with ratings of from 5-10 to 7-12, as well as an increased production of small tractors of the universal type. In addition, there will be a strong selling campaign made on the garden variety of tractor. This latter machine is meeting with considerable demand in the east and efforts to popularize it there are being made by a number of concerns.

It may be expected also that considerable progress will be made during 1920 with the motor cultivator. During the last year or two these have been tried out so conclusively that their utility has been established and corn growers are beginning to see that they are practicable and economical.

The tractor itself has not been able to go as far as some of the early enthusiasts thought it would in the elimination of the horse from the farm, particularly in the corn belt. The average tractor will not take care of the corn crop. The motor cultivator will. With attachments for listing, planting and cultivating, it will do everything that is necessary for the planting and cultivation of row crops and with its more extensive adoption by the farmers it will actually in time displace more farm horses than will the tractor itself.

While two years ago a horseless farm was regarded as hardly a possibility such farms are now to be found in every section of the country, and their number is increasing rapidly. With the tractor for the heavier work, the motor cultivator to take care of the row crops and to help in the light 2-horse work and the motor truck for transportation there is practically nothing left for the horse to do.

Merchandising is Big Problem

The big problem confronting the tractor manufacturers is the merchandising of their product. The most reliable figures available built for the trade during 1920 and the manufacturers are concerned over who is to sell them. There is an admitted demand, but it is a demand that requires the services of the right kind of dealers to reach. It is impossible for the manufacturers to take care of this direct, as they did in the early days of the tractor business, and an efficient dealer organization is an all-essential factor now.

This problem is the more serious for the concerns which will not have large production, regardless of the quality of their product and for this reason it may be expected that strenuous efforts will be made during the coming year to build up organizations that can make the proper introduction of the machines and be ready for the increased production which will follow in the future.

The fuel problem is still a problem. The farmer demands a kerosene burning tractor, whether that fuel really is cheaper or not in the long run than gasoline. The farmer thinks it is and that is good enough for him. Therefore, he wants to burn it. Some of the tractor manufacturers have made no concessions to this preference and frankly sell gasoline burning tractors. Others are trying to make kerosene burning a sales argument, and are having but indifferent success. Some of the tractors are meeting the kerosene condition fairly well, and for this reason have a present sales advantage. Inasmuch as big tractor demonstrations have been eliminated from the scheme of things for the future it is probable there will be a big attendance of dealers at the three authorized tractor shows that are scheduled.

The first will be at Minneapolis, opening on Saturday of this week. The Minneapolis show is automotive and industrial, and is one of the biggest things of the kind staged in the country. The tractor section will occupy considerably more than double the space it filled last year and every machine which is at all adaptable to the demands of the Northwest will be on show.

National Tractor Show Big Event

The second show in point of time will be the tractor and power farming equipmnet show to be held at Wichita, Kans., Feb. 9 to 14. The list of exhibitors indicates a large number of tractors on display and a very comprehensive exhibit of tractor drawn and tractor operated machinery.

The National Tractor Show to be held in Kansas City, Feb. 16 to 21, will, of course, be the big event in the tractor year. Here will be shown practically everything that has been accomplished in the way of tractor development and tractor progress.

Rapid progress has been made during the last year in the development of specialized tractor machinery, both for use on the drawbar and the belt. The increased importance of using the tractor for the belt work on the farm has been one factor in encouraging this development, and it is not unlikely that in the near future nearly every tractor of large production will be put out with a line of power equipment especially designed to be used with it.

In fact, the lengthening of the lines of the tractor manufacturers is a trend of importance, because it has been demonstrated that the dealer in tractors must become a dealer in tractor equipment and many of the companies already are in a position, and soon many more will be, to give the dealer a complete line of such farm operative equipment.

Automotive Dealers Can Enrich Farmers

To Lead in Selling the Idea of Power Farming and Thus Speed Up Agriculture

BY FRED M. LOOMIS
(Motor Age Editorial Staff)

IT is an axiom of good business that any increase in the cost of the equipment for conducting a business should be followed by an increase in production, or in quality of production, or both, else the increased investment in equipment is not economical.

And that is just what the farmers of the United States are up against today, and that is why there never was such an opportunity for the automotive dealer to cash in on an application of the foregoing axiom. It is his opportunity to sell that equipment to the farmer which is economic and which can be proven to be so by the results. And that, too, is just what the farmer wants.

Take the case of the average farmer on the average 160-acre farm, for instance.

Farmer's Production Formerly Limited

The average farmer always has produced all he could with the equipment he had to work and to the limit of the cultural methods he employed. Whatever may have been said about the farmer by men and theorists who had no practical farming experience of their own upon which to base their criticisms, the farmer did the best he could within his lights and abilities, both mentally and mechanically. And as a result, the average income from the farm, measured in terms of dollars, was so pitifully small up to the time of the world war that the ordinary clerk in any store would scorn it if offered to him as a salary. To be sure there were other compensations in the vocation of farming, which the clerk could not have and concerning which he knew nothing, which made farming attractive. But measured in per cent of return on investment, the cash return to the farmer in proportion to what he had invested in his farm and equipment, was smaller than that realized from any other going business whatsoever.

For, did you ever think about the relative investment there was in the individual busnesses of the men in any rural community? Most of us think of the banker, the drygoodsman, the hardware dealer, the automobile dealer and the implement man as the capitalists of the community. Not so. The real capitalist is the farmer. Take any farmer who owns as much as a quarter section of land in the good parts of any one of the agricultural states. Assume that the quarter section is just normally equipped. Figure up what an investment that farmer has.

Take values as they were before the war. The land would be worth, according to location, from $150 to $300 an acre. The mechanical equipment on a quarter section farm would have cost from $750 to $1,200. The six horses, which are considered normal on such a farm, would be worth from $100 to $300 each. This takes no account of what might be invested in special improvements or equipment. Ever figure that out?

It amount to this: Before the war the average quarter section farmer in any good agricultural community, had invested in his business anywhere from $23,350 to $51,000. Compare the investment of any or all of the business men of the town, from the banker to the undertaker, and it is doubtful if any of them, with the possible exception of the banker, has as much invested as the least opulent of these farmers.

Now it happens, too, that the farmer, as a producer, occupies a peculiar position. His big investment is in land. It is not active capital. His smallest investment is in the tools of his trade, his operative equipment. His power plant, that is, his complement of horse, is little less or even considerably more of an investment than he has in his tools. That is, such was the fact under horse farming conditions which practically were universal prior to 1914, the year in which the war broke out.

It was necessary for the farmer to have a full normal equipment, both in tools and power plant, if he was to realize any return at all on his investment in land. Professor Thatcher of the University of Minnesota, says that 34 per cent of farmer efficiency is due to the skill with which he uses his equipment. It is easy to see, therefore, how the farmer was compelled to use both his tools and his horses to the limit of their capacity, and even so he could make but a small return on his land investment.

Prior to 1914 the following was considered to be a normal mechanical equipment for a quarter section farm, with its approximate cost:

1—14-inch gang plow	$ 60
1—14-inch walking plow	14
1—3-section drag harrow	18
1—7-foot disk harrow	30
1—Corn planter	42
2—Riding cultivators, at $26	52
1—Grain drill	100
1—6-foot mower	50
1—Sulky hay rake	25
1—Binder	125
1—Farm truck	30
1—Farm wagon	100
1—Windmill	25
1—Manure spreader	115
Total	$786

Add the average value of 6 horses at $150 each, and the cost of mechanical equipment and power plant mounts up to $1,586.

Furthermore, it was estimated that the annual upkeep of a horse in 1914 amounted only to $125, and farm labor could be obtained at from $30 to $40 a month and board.

War Changes Situation

With the war things skyrocketed. The cost of land nearly doubled. The cost of farm labor, when labor could be obtained at all, more than doubled. The cost of horse maintenance has gone nearly if not quite to $200 a year. The cost of all sorts of farm operative equipment doubled or nearly so. A gang plow now costs $125, a walking plow $25, a grain drill from $140 to $150, a binder $240, a manure spreader $200, and other items are up in proportion. Horses alone have not advanced in value.

Now here is the crux: With land, labor and equipment prices doubled, necessitating a doubled investment, a horse, or a plow, or a binder, or a grain drill can do no more work in a day than it did prior to 1914. With the same equipment, and with the same number of acres, production can be no greater with equivalent equipment today than it was in 1914, because then as now both equipment and power plant were worked to capacity.

True, the market value of the product from those acres also has doubled, but after all that means little or nothing. The percentage of return in the farmer's business is no greater than it was before his investment in equipment doubled, hence, according to our axiom, the present situation is uneconomic for him.

Now the farmer realizes this situation more keenly than does anyone else. He knows his only salvation lies in an increased production, a production which shall show a tangible increase for every unit of power and equipment applied to it. Every man working on the farm must produce more per hour; every plow must turn more land per hour; the drill must plant more acres per hour and the binder must cut more acres of grain per hour. There is only one way in which this can be accomplished. Every process must be speeded up and made more effective. Men cannot be multiplied because they are unavailable and too costly. This limits the number of horses and tools which can be put to work. The sole solution is the tractor.

Tractor Is Solution to Problem

The tractor can substitute for 27 per cent of the horses on the average farm and cut down the cost of horse maintenance just that much. The tractor with one man will accomplish as much in one day as four men with the usual complement of horses. Plowing capacity is

multiplied by four and other farm operations are speeded up in proportion. In addition, it has been proven that power farming, when plowing, seed bed preparation, tillage and harvesting are done by power, increases actual production from 10 to 40 per cent according to circumstances.

This, then, is the duty and opportunity confronting the automotive dealer—to sell the farmer the only thing which will solve his problem and resolve his difficulty—sell him power farming. This does not mean to sell him a tractor exactly, but to sell him the idea.

The automobile dealer sells locomotion, transportation, speed, comfort and luxury when he sells an automobile. The automobile dealer sells transportation and utility when he sells a motor truck.

The automobile dealer must sell labor-saving, increased efficiency, increased production, better and more profitable farming, when he sells a tractor.

And this means that when he sells the idea of power farming he sells not only the tractor but all the equipment as well which goes with it and thereby he sells the farmer that economic investment in equipment and power plant which makes it possible for him to get a satisfactory return on his investment in land, no matter how great that may be.

This means that in selling tractors and power equipment the pencil is as useful and powerful as is the demonstration. Ineded, the pencil should come first. The tractor is but the means to an end—it is not what the real tractor dealer sells—he first shows how the substitution of power farming and equipment will lift the farmer from the slough of economic despair and place him upon the solid ground of economic production. Once this is shown to the farmer the sale of the wherewithal, the tractor and the power equipment which make it effective, follows as a matter of course.

Automotive Dealer the Right Man

The automotive dealer is the ideal dealer to put this idea across. Already he employs analogous ways in selling his automotive equipment of other kinds so he does not have to learn new ways of thinking. He simply applies his methods to a new line of endeavor. That he is doing so is evidenced by the signal success automotive dealers are meeting with in selling tractors all over the country.

That is the important point, too. Any business to be attractive must be obviously profitable, or the paths to profit in it must be plain. Already these paths in the tractor business are well beaten. The economic necessity of the farmer is uniform and universal. There is no agricultural community in the country in which the tractor should not be sold and where it cannot be sold. It is the one universal panacea for the financial woes of the farmer. The dealer who gets this vision of the function of the tractor and who uses logical, intelligent propaganda in talking power farming is bound to succeed in the tractor business.

The possibilities practically are boundless. After making all allowances for those factors which at present hamper the universal adoption of power farming there is a present, visible demand for tractors far in excess of possible production. The farmer himself is sold on the tractor and stands ready to adopt it just as soon as he can be convinced that the particular tractor offered to him will serve him economically. This is so easy to do for anyone who will look even a little way into the facts that the dealer need have no fear of a lack of demand in his locality.

Present estimates on tractor production for 1920 indicate that something like 300,000 tractors will be built to supply a demand which easily is four times that. In addition, with every tractor will go more or less of the power equipment. Conservative estimates of the volume of trade likely to be secured during 1920 on tractors and power farm operative equipment indicate a volume which will be in the neighborhood of $500,000,000. And this is likely to increase year after year as the idea of power farming is adopted by more and more farmers.

Service Important Factor

In the development of this business automotive dealers have a wonderful opportunity for usefulness and profit. Already they are a tremendous factor. The present constitution of the selling organizations which will distribute the tractor output of 1920 sanction the belief that automotive dealers will sell fully 170,000 of the 300,000 tractors which will be sold.

Furthermore, because the automotive dealers are selling tractors on the right basis, because they are rendering service on the right plan, and because they already have a clearer vision of power farming opportunites, they are the tractor dealers who are making the money today and who will make more tomorrow.

This is so because the tractor trade holds a promise which has a peculiar interest for automotive dealers.

Tractor manufacturers rapidly are coming to a realization that the dealer who sells the power farming idea, who puts out the tractor as a means to an end and not as the end itself, who appreciates the economic importance to the farmer of keeping that tractor at work and who does keep it at work by the service he gives, who has the ability to run his own business, sales and service, without recourse to the factory, is the dealer to whom adequate compensation is due. Already some of the manufacturers are giving such dealers the extra compensation they deserve. Others will be forced to follow suit. It is significant that most of the dealers who are at present receiving this special compensation are automotive dealers.

This then is the opportunity of the automotive dealer in the tractor business: To sell an idea and to sell it right; to gain control of a half billion dollar trade; to put the farmers of the country onto a basis of real financial independence, and, incidentally, to make good money doing it.

New Trucks at Chicago Show

(*Continued from page* 84)

An inherently governed speed of 25 m.p.h. is obtained by the use of a special manifold construction, that does not allow the engine to reach a higher speed than that necessary to drive the truck at 25 m.p.h. This attained by making the manifold of a restricted size so that the maximum gas velocity is attained at the speed mentioned above. The engine and transmission form a unit power plant suspended on three points.

A special feature of the engine construction is the rams-horn manifold and hot-spot that is designed to overcome the chief difficulties in connection with the present day low grade fuel. The hot-spot is heated by the exhaust gases, Advantage is taken from the fact that the globules of fuel have a greater inerita than the air and are consequently hurled forcibly against the hot surface of this heated portion. The clutch is of the cone type. The surfaces are lined with asbestos and operates continuously in oil. The worm of the worm drive axle is located on top, which makes an almost straight line drive possible.

IMPLEMENT DEALERS ORGANIZE

St. Louis, Jan. 26—Resolutions authorizing the incorporation of the Mississippi Valley Implement Dealers' Association under the laws of Missouri and endorsing further education of the farmer by the manufacturers and distributors of motor tractors were adopted at the closing session of the thirteenth annual convention of the organization which terminated at the Hotel Planters in St. Louis following a three-day conclave, January 20, 21 and 22.

The annual election of officers came during the business meeting January 22, and resulted in the naming of the following men for the 1920 term of office:

Henry F. Woerther, Ballwin, Mo., president; Frederick P. Watson, Mt. Vernon, Ill., chairman of the Board of Directors; Frank E. Goodwin, Kirkwood, Mo., secretary-treasurer. Vice-presidents named were: Arkansas—Hamp Williams, Hot Springs; Alabama—S. E. Stewart, Hartsville; Illinois—E. A. Kahl, Shipman; Louisiana — Max Thieme, Winnfield; Georgia—B. C. Reid, Reidsville; Mississippi—G. A. Wade, Greenwood; Missouri—T. N. Whitton, Trenton; Oklahoma—B. E. DeHart, Wilburton; Tennessee—W. H. Edenton, Jackson.

CUT APPROPRIATION FOR AIR MAIL

Washington, Jan. 27—The request of the Postoffice Department for an appropriation of $3,000,000 for the air mail service has resulted in a reduction by the Committee on Postoffice and Post Roads to $850,000, which has been recommended to Congress as an appropriate amount for the service.

SERVICE—

P. E. Chamberlain of the Cadillac Motor Car Co. of Denver Gives Some Brief and Telling Thoughts on What Service is and What It Should Be

Dealers generally recognize that something is wrong with their service. And, generally speaking, EVERYTHING is wrong.

When a condition becomes as extreme as the present condition of our service business, it requires extreme—radical, if you will—methods in order to correct it.

Our trouble is with methods and with the management of those methods. We do not need BETTER service managers—we need **less** service managers, and more **service salesmen.**

"Service Manager" covers everything from the head of the three-man shop to the executive of the largest service business in the country. As well say that a dry goods store of small proportions could not have up-to-date merchandising methods as to say that the small repair shop has to be dirty and use slip-shod methods because it works but three men.

There are opportunities for profit in the serving of automobile owners in the smaller towns, yet untouched. It is a mystery to me why someone in each town of from 1,000 to 20,000 does not seize this opportunity. Right methods there will build a business larger than that enjoyed by the average dealer in the larger city, since he must share with many competitors, while the small town, under the conditions I state, would have practically none. This opportunity has to do with nothing in the world but GOOD MERCHANDISING METHODS, cleanliness, order, system, and INTELLIGENTLY SOLD SERVICE.

I know a garage business in a small town in Colorado which made $12,000 on paper one year. Instead of having it, the bank took over the business and reorganized it. That town has potential profits for some man of $25,000 a year easily.

The service manager—so-called—is the man who stands at the neck of the hour glass and hastens—or retards—the progress of the golden sand which flows from the car owner to bigger profits. Unless he is the right kind of a man, the methods over which he exercises supervision will not be right.

In this Service Revolution, which is coming, the Service Manager will no longer be a technical man—he will be a Service Sales Manager. Why not? Is he not SELLING? He is NOT—now-a-days. But he should be.

Why not require the man who meets the public in a clothing store also to keep the books? Of course while he was busy on the books, or arguing about a bill over the phone, new customers would have to wait. But what difference would that make? Why not require your new car salesmen to be a technical man and go out with owners to shoot trouble? Why is it necessary to have new car salesmen clean and neat, stepping out with a smile to greet the incoming customer—every time?

When you go in to have some shirts made, why not talk to the man who makes them, instead of to a salesman? Why not call him out in his working clothes with his sleeves rolled up and the tools of his trade sticking out of various pockets?

This is not done. A salesman sells you the shirts. If something technical enters into the discussion, this salesman may have to call in the man who actually does the work, or supervises the doing of it. But one is a technical man, and the other is a salesman.

The present day Service Manager is NOT a salesman. He is a technical man. He knows little or nothing of the psychology of selling. His attitude is one of contempt because the car owner who drives in knows so little about his car. His actions and words are not studied from a sales standpoint. That man cannot deal with the public properly.

I recently entered a large service station in one of the eastern cities. I was conducted through considerable dirt to the Service Manager's office, which was a dingy affair surrounded by automobiles. When he came in he carried a set of gears in his hands, which were greasy from handling them. So dirty were they that he could not shake hands when we were introduced. Had I been a customer, the conditions would have been the same. No doubt some knotty technical problem had been receiving his attention, but I submit that his job should be to SELL SERVICE, and that the business should be so arranged that he did not have actually to work on the service, after he had sold it, one way or another.

If a new car salesman does his work, which is selling the car, he writes his order, and the bumper and spot light are installed in another department. Why not have the salesman himself leave the floor and install the accessories? Because you know, and everyone knows, that isn't his job, and that, if he did so, the next customer who came in would not receive prompt attention.

This is preliminary to stating my firm belief that the SALES SERVICE must be divorced permanently from all departments which actually PERFORM SERVICE. The method is a matter to be worked out by each individual business. You must put in a SERVICE SALES ROOM which will be as clean and tidy as your new car salesroom. In charge of that must be a SERVICE SALES MANAGER, and under him sufficient SERVICE SALESMEN to take care of your patronage. In the small shop one man may be both.

The line of responsibility between intelligently selling service, and that of performing the service must be clearly drawn. One is the job of your Service Sales Manager, the other comes under the duties of your Shop Foreman or your Superintendent.

I make a prediction: That as long as your foreman meets your public, your public will not be satisfied.

Just try the new order. Adjustments cost you plenty now. An experiment cannot cost you more—probably a good deal less.

There are plenty of $10,000 a year jobs waiting for Service Sales Managers. "Service Managers" are rapidly going into the discard. Few people enjoy speaking dead languages, and the old-time bunk given the owner at the Service Desk is rapidly becoming a dead language. It has no place in the brilliant future of this wonderfully interesting end of the automotive industry.

What Truck Service Should Be and How It Should Be Rendered

BY HENRY PAULMAN
(Pierce-Arrow Distributor, Chicago)

A thorough organization is necessary to the success of any truck service station, is the belief of Henry Paulman, one of the largest distributors of motor cars and trucks in the middle west. Mr. Paulman's hobby for years has been the development of his service work, both for passenger cars and for trucks and his success is best evidenced by the large volume of work his station is called upon to do. Motor Age esteems itself particularly fortunate at this time in being able to present the speech made by Mr. Paulman on Truck Service before the convention of the National Automobile Dealers Association.

IN presenting these ideas on motor truck service I realize they have been developed by ourselves and the factory organization on a much larger scale than the average dealer can afford to maintain, nevertheless the fundamentals are applicable to any service station, large or small. We believe in the law of service; that is, your reward will be in proportion to the way you serve.

Service means to keep your customers' trucks on the road the greatest number of days in the year, at the least possible expense to the owners.

A fixed policy should be adopted which is absolutely unbiased, for favoritism would be annihilating, and this policy should be applied by an organization of courteous employees.

Trucks are bought to earn money. Delays in making repairs not only increase the up-keep expense but decrease, on a greater ratio, the earning capacity; therefore, dispatch is necessary on all repair jobs.

Truck sales are subservient to truck service from a standpoint of satisfying and holding the customers' confidence and good-will, thereby intensifying that greatest form of all advertising known as "mouth to mouth," where the customer boosts the product and the organization back of it.

The co-operation of the truck owners and the confidence of the dealers' service department are necessary for perfect service.

With these fundamentals understood and adopted you may lay out your dealers' service plan under the following captions in the order named. In this paper we are describing our truck service organization methods which have been developed after years of study by ourselves and the factory service organization.

1. Location.
2. Type of building.
3. Organization.
4. Executives.
5. Policy.
6. Analyzing and organizing truck fleets from an operating, accounting and maintenance standpoint.
7. Personal service.
8. Resistance set up by owners making it dfficult to render service.

LOCATION

In selecting the location of a service station for motor trucks thought must be given to the matter of convenience and accessibility. A corner is preferable; the streets upon which the building fronts to be free from street cars, giving easy access and egress of the building. The building must also provide good light and ventilation. It should permit of expansion to meet rapid growth without too much of a burden. Cheap ground rent must be secured, owing to the space it takes to handle trucks. It should also have easy access to railroad facilities for handling and receiving truck unit shipments.

ORGANIZATION

In our present building we service both passenger cars and trucks, but maintain, as far as possible, two separate organizations. All service work comes under one service manager, and is sub-divided into two departments under the title of "truck service executive" and "passenger car executive"; inasmuch as our subject is "Truck Service" we shall confine ourselves to that division.

The service manager has charge of everything pertaining to service. He controls all service station employees; fixing the rate of pay; determines and passes on all policy allowances with the owners; supervises and controls the amount of repair parts stock necessary; is responsible for mechanical efficiency of the service station as a whole; O. K.'s all invoices and estimates for work to owners; handles most important mechanical matters with the factory and owners.

The service executive handles all mechanical truck matters with the owners and our own sales department. He supervises and controls our truck inspection; supervises and controls the truck inspectors and testers as to their movements whether regular or emergency; arranges definite time with repair shop foreman as to when trucks are to come in; and issues all orders for truck repair work necessary; giving instructions at the time as to the disposition of charges if work is to be done other than which the customer should pay for; supervises all billing to owners and suggests any further adjustments necessary after consultation with the service manager. He keeps a history card of each individual truck, showing the amount of repairs that have been made and the percentage paid for by the customer and the percentage absorbed by ourselves; also the mileage of trucks, the fuel consumption and the average load which the truck carries and information received from his truck inspectors. He makes a report to the factory of any unusual mechanical performances or failures; makes out estimates for repairs and submits same to the service manager for his O. K.; makes delivery. of new and used trucks and sees that drivers are properly instructed.

SHOP FOREMAN

The shop foreman supervises all repairs made; does only that work specified on the shop order unless further orders are received from the truck service executive.

TYPE OF BUILDING

The building should be one or two stories high, eliminating the use of elevators as much as possible, owing to the cost of lifting such heavy loads. The land should be of such dimensions as to permit of erecting units not less than 65 ft. in width, free of posts if possible which will permit the removal of trucks on their own power with a minimum of movement. The ceiling and entrances should be very high, the lowest clearance to be 14 ft. in order that omnibuses and furniture vans and trucks of this type may be accommodated. If the building is two stories or more, necessitating lifts, the elevator should not be less than 12 by 30 ft. Great care should be used to obtain as much daylight as possible in order to shorten the hours of work under artificial light. The fumes from low grade gasoline makes ventilation highly important. Good sanitary working conditions secure the best mechanics and permit them to give best effort. A good, but loggy mechanic, is not conducive to the attainment of the end we seek.

TRUCK INSPECTORS

Truck inspectors are assigned to regular routes and carry out our in-

spection system taking care of all emergency work in their district where possible.

The selection of men for operating these departments must have great care. In the first place, they must have a mechanical training to the point where they can do or make any repairs that an owner might need on the truck. In addition, they must have knowledge of shop practice and methods, a liking for details and a knowledge of record keeping methods; in addition to this, they must be earnest, courteous and loyal men with a fair amount of sales ability. Only men of good character with initiative and ambition will properly fill the requirements. We try, in all instances, to fill the department head positions from testers and truck inspectors, for the reason that they have been taught our methods, have the proper experience and the happy thought of our executive positions being filled from within our organization.

POLICY

The formation of a policy is developed from the experiences of the factory and ourselves. This policy is published in book form which prevents misunderstandings between the owner and our organization.

Our first point of contact on the delivery of a new truck is to see that the driver is properly instructed in the operation and care of his machine. We prefer to give these instructions before the machine arrives in order to make quick delivery and get the owner on an earning basis as quickly as possible. After the truck has been placed in service it is then regularly inspected on the following basis:

In addition to keeping the truck operating at a small maintenance cost, a part of the inspection is to preclude unnecessary heavy repairs by having failing parts attended to at the proper time, and arranging at that time both with the owner and our shop for the hour at which the truck is to appear for repairs, in order to make quick repairs. All trucks are carefully inspected and the necessary minor adjustments attended to by regular inspector, without charge, for three consecutive years after date of delivery of the truck. The frequency of the inspection depends upon the distance of the truck from the service station, which is divided into three zones:

1. If within 25 miles, semi-monthly inspection is made.

2. If beyond 25 miles and within 50-mile radius, monthly inspection.

3. If beyond 50-mile radius, special arrangements are made based on the distance from the service station where inspector is required to go.

After three years' period of gratis inspection this service may be continued by the owner on a basis charge of $30 per year on all trucks within a 50-mile radius of our service station.

We seem to have considerable difficulty in persuading the owners of trucks to continue our highly developed service after the term of our gratis inspection system expires. I might state I have owned in my own home for the past twelve years a Steinway piano. This has been carefully inspected, tuned and kept in good order by the same expert making regular calls during that entire period. We have two elevators in our buildings. One of these buildings we have occupied for oven ten years. These elevators have also been carefully inspected by service men, representing the manufacturers who originally installed them. We have always paid for this service and are always glad to receive it, feeling that in the long run considerable money is saved and the danger of a serious accident avoided by this constant attention. It stands to reason where companies specialize in developing highly trained mechanics far greater results will be obtained by having this type of men inspect the trucks than to have your own organization attempt to handle trucks of half a dozen different makes. When taking a used car, which needs mechanical attention, in trade, we find it profitable to send it to the service station of the organization handling that particular make of car.

We require the truck inspector to instruct the driver to make minor adjustments during the inspection, in order to raise his efficiency and make it possible for him to take care of the trouble should it occur again. We are particularly insistent on this inasmuch as it raises the standards of the drivers of our trucks and increases his confidence in us.

In emergency cases, where serious repairs are necessary because the truck cannot be brought in to our service station under its own power, the inspector calls the truck owner and reports the repairs necessary, and advises as to the number of men required and the work to be done to get the truck in to the service station and in shape again, and on his approval makes the necessary arrangements with the service department to have this taken care of.

After inspections have been made and written reports are made by the inspector who secures the signature of the driver, or whoever is in charge of the truck, a copy of it is mailed to whoever the truck owner may designate and the other one left with our service department.

In order to prevent misunderstandings with owners our truck service executive decides whether repairs are necessary, the amount of which the owner should be billed and the amount which we should assume before the truck goes into the repair shop. In actual practice this matter of replacements has been worked out with the factory and ourselves more in terms of mileage than in time. Up to a certain point of mileage the factory assumes the cost for the repair job, that is, furnishing the parts required and permitting us, as dealers, to bill them for the labor. At another point in mileage the factory furnishes the repair parts and we stand the amount of labor; beyond that period any further adjustments necessary are handled at the sole expense of the dealer. Great care is used by the truck service manager, at the time that repair orders are being written, that the correct division is made so the customer will never be billed with any repair work except that which he should assume, and therefore eliminate as many disputes as possible.

In addition to this service we render a service in which the mechanical service, sales and accounting departments work in conjunction; that is, suggesting proper size garages, proper routing of trucks to make them pay, proper forms and maintenance methods and proper accounting methods to correctly determine the cost of hauling. While this service has been of great value to our customers, it has also been of great value to us; especially in cases where new transportation companies have been organized and sales have been made on deferred payments, thus furnishing us accurate data on their operating methods and permitting our greater experience to direct them along proper channels.

We have recently decided to rearrange some of the various departments in our service station, in order to obtain greater space for our rapidly expanding business. Before using our own judgment as to just where these various departments should be located we employed the services of an industrial engineer in order that he might lay out a service station plan that will permit the greatest volume of business at the least possible expense. We constantly strive to keep the labor cost per hour at the lowest possible point. I feel we have been very successful in this for the reason that our selling price of our labor is less than that of our competitors.

Our sales department has what is known as a personal service, which consists of a special form and color of letterhead and envelope sent out under the title of "Paulman's Personal Service," in which they endeavor to keep the owners of their trucks posted as to changes in the laws or ordinances pertaining to the operation of motor trucks. Filling in and furnishing state application blanks for licenses and forms for covering the city wheel tax licenses, etc. Also, information at different periods of the year pertaining to what care should be taken to see that trucks are properly protected against the severe weather and proper forms are given on anti-freezing solutions, etc. Also what improvements are being made in road conditions, furnishing maps of city and county.

I hope that the ideas presented herewith will assist the truck dealers in establishing a service that will mean profits to themselves as well as to the owners.

New Service Equipment

There are a number of interesting displays of shop equipment at the Chicago show, some of which show things that are new.

An Electric Valve Grinder

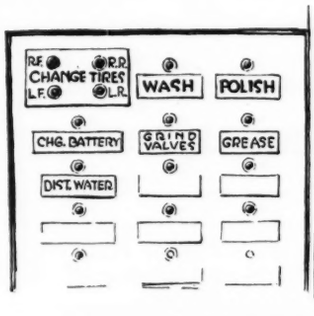
An electric valve grinder which is said to grind a valve ten times faster than it is possible to do it by hand is shown by the Black & Decker Mfg. Co. The grinder consists of an electric motor and grinding spindle. It has a pistol grip and trigger switch which makes it very easy to handle.

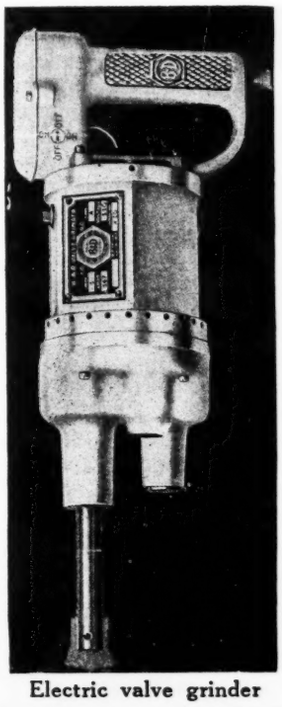
The grinding spindle runs in a long bronze bearing and is provided with a ball thrust bearing. The gears are cut from special steel and are mounted on shafts ground to size and running in bronze bearings. The gear train and reciprocating mechanism operate in grease in a grease tight housing. The motor will develop one-sixth hp. and operate on either direct or alternating current of from 25 to 60 volts or on any two wires of a three-phase current. The motor is cooled by means of a centrifugal fan on the armature shaft.

Filtered Air Compressor

The No. 7 Au-To air compressor is a new piece of shop equipment shown by the Au-To Compressor Co.

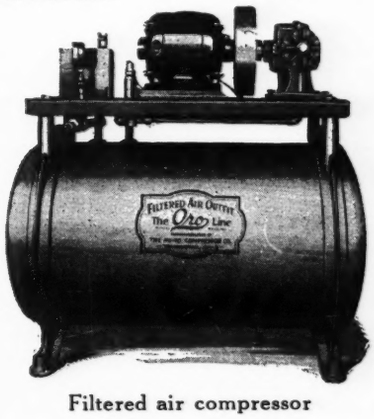
The new compressor supplies filtered air, thus obviating the difficulty sometimes experienced by the admission of dust and oil particles into the tires. The machine is self contained, comprising motor, mounting, valves, piping, gage and all other equipment. When installed it is ready to operate. It has unloader which enables the motor to reach maximum speed before operating against load and an automatic switch, which breaks the current and stops the motor when the desired maximum pressure has been reached and starts the motor when the desired minimum pressure is reached. The machines leave the factory with the switch set to cut in at 120 lb. pressure and out at 150 lb. the tank always is full of filtered air.





Electric valve grinder





Filtered air compressor



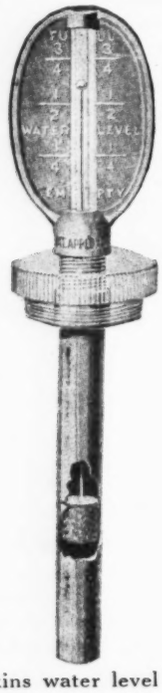
Battery compound melting pot

Battery Compound Melting Pot

An electrical device that serves a necessary purpose in the battery service station is an electric compound melting pot which keeps the sealng compound for the batteries at an even heat capable of being regulated at any of three degrees. The current consumption is very small, costing less than one cent an hour to operate. One of the features of the device is that, should the operator by any chance forget to leave the melting pot connected on the circuit there will be no chance of producing a fire. The device is made by the General Electric Co., Schenectady, N. Y.

New Accessories

THE accessory show at the Chicago Automobile show, as usual, filled the galleries in the Coliseum, Annex and Armory. There have been better accessory shows perhaps at previous shows, but none more interesting or comprehensive. Practically all of the familiar things which have been developed during the last few years were present, and there were, of course, some things which are new. The new accessories, however, are not as numerous as they have been in the past, but, as is to be expected, whatever is new shows a decided improvement in detail and usefulness over the past.



Brookins water level meter

Brookins Water Level Meter

The Brookins water level meter is an instrument that is attached to the cap of the radiator and which by means of its float level indicator tells the height of the water in the radiator. An instrument like this performs a very useful purpose and many motorists have had considerable difficulties because they have started off on a trip without examining the condition of the water. The instrument is made by The Brookins Mfg. Co., Inc., Dayton, Ohio. It lists at $4.50.

Universal Tire Lock

"Houdini can't open it" says the Edwards Sales Co. of this new Universal tire lock which the company is displaying at the show. The lock consists of a cable, surrounded by a flexible steel armor which is impervious to edged tools within the time the ordinary thief can work. After pulling the cable tightly around the tire it is locked by a Yale lock which responds only to the key intended to fit it. The company claims practically absoute protection against thievery when the car is equipped with this lock.

Visible Gasoline Gage

The Stemco Engineering Co. is displayng a new visible gasoline gage for the instrument board. The Cole gage consists of a float valve in the gasoline tank, connecting with the indicator on the instrument board by means of a flexible tube. Every change of level in the tank registers immediately on the card in the gage which shows at all times just what supply of gasoline there is in the tank, measured in gallons. The advantage of the gage is that it affords a perfect check on gasoline purchases as it will show just the amount of gas which is put into the tank, and when on the road it shows the constant level so that the driver knows instantly when his supply of gasoline is getting low and requires replenishment.

Liberty Spark Plug

An unusual appearing spark plug is being made by the Federal Corp., Westfield, Mass., which is sold under the trade name of Liberty. It is a large heavy duty plug, having its electrodes made from a special alloy, but the big feature of the plug is the insulator which is made of Steatite. The material Steatite is a natural insulating material that resists action of heat and cold.



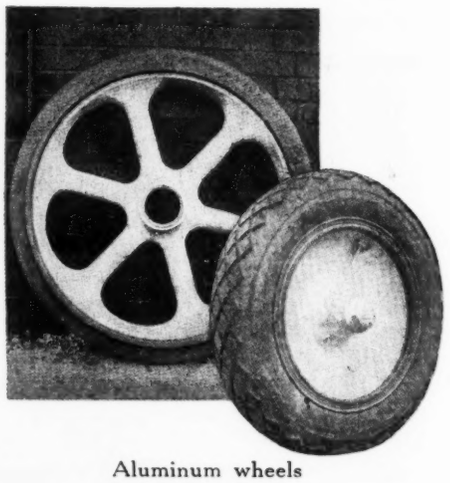
Liberty spark plug

Aluminum Wheels

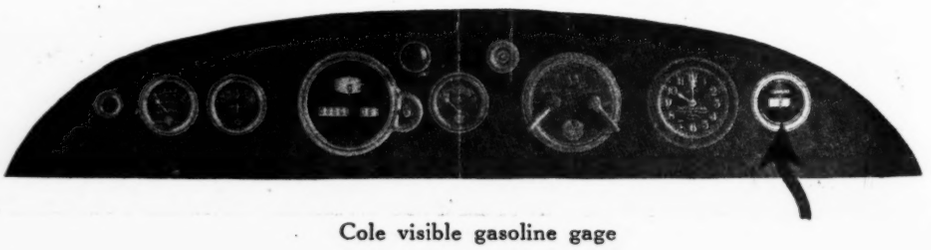
An interesting dsplay is that of the Aluminum Manufacturers, Inc., which shows the Lynite motor car wheels. Lynite is an aluminum alloy with a tensile strength of 27.500 pounds per square inch and is very light. The object of the Lynite wheel is to reduce the weight of the car below the axle and to give the advantages engineers claim for such a result. The wheel is made in both disk and spoke types and has been tested under strenuous conditions. They are pleasing in appearance, and it is claimed by that company that they have the advantage of affording easy tire changes, because they do not rust and the lock ring and tire are never frozen in place.



Universal tire lock



Aluminum wheels

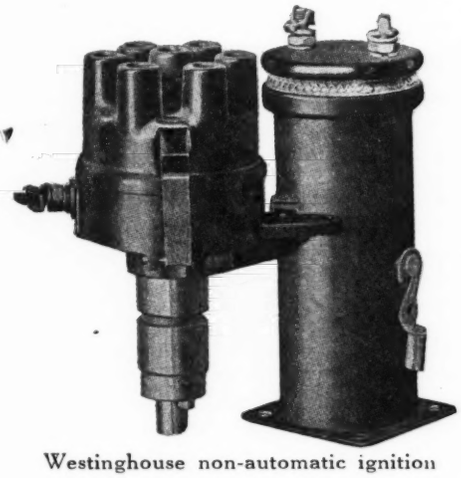


Cole visible gasoline gage

Westinghouse Non-Automatic Ignition

A new ignition device, known as the Type SC Non-Automatic, is being shown by the Westinghouse Electric & Manufacturing Co.

The Type SC is a two-unit open circuit non-automatic form of 6 and 12-volt battery ignition that can be applied to all 4, 6 and 8 cylinder engines. It includes a condenser that is practically indestructible under ordinary service conditions. A cam, made of self-lubricating material, that will require little if any attention. Breaker contacts for which a life of 10,000 miles without attention is claimed. A coil which is protected from both electrical and mechanical injury, and other features which will appeal to the user of a device of this character.



Westinghouse non-automatic ignition

New Edelmann Appliances

E. Edelmann & Co. are showing several new items in their line this year. One is an assortment of solderless couplings, brass fittings, cocks and priming cups, all enclosed in a special case. The assortment includes 154 pieces and provides not only a ready receptacle but an instantly available supply of the many small parts needed for quick service.

The "Hand-D" hammer is another. This is an all metal hammer and three screw drivers combined into a handy tool. The set is nickle plated and polished and presents an attractive appearance. It will be appreciated by the mechanic and the motorist.

The company also is showing a new swing spout oil measure which will meet some of the difficulties garage men now experience with the rigid spout measures so many of them use.

Steering Wheel Lock

A new form of steering wheel lock that consists of a small nickel plated ring secured permanently to the steering post. When the lock is in its closed position a hardened steel pin passes through the outside steering column into the steering tube thus securing the steering gear so

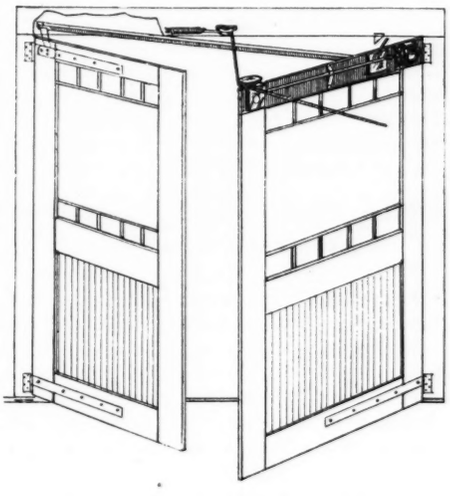


Swing spout oil measure

that the position of the front wheels cannot be changed, thus preventing the car from being driven or towed. It has the approval of the Underwriters Laboratories and is made by the Hershey Mfg. Co., Equitable Bldg., Denver, Colo.

New Curtain Windows

A number of new styles and shapes of plate glass curtain windows are shown by the Wm. R. Johnston Mfg. Co. Because of the greater beauty and finish given to the motor car by the use of plate glass for curtain windows there has been a rapidly increasing demand for an accessory of this kind. The Johnston company has responded to this by multiplying its designs and shapes until now it is possible for any desire or taste to be satisfied in Johnston windows.



The Master Electrical Primer

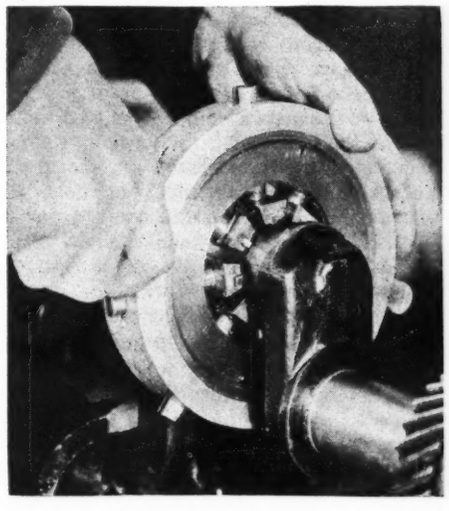
The Spitdorf Electrical Co. is showing an electrical primer which can be installed on any car and which, it is claimed, will start the car in zero weather.

The Master Primer is an electrically heated vaporizer, operating as an auxiliary carbureter to effect an instantaneous starting of the engine regardless of weather conditions or the grade of gasoline used. It takes the gasoline direct from the carbureter, vaporizes it by heat, and turns it into the manifold, a hot gas that ignites on the first spark.

The primer is carried by all the Splitdorf branches and is sold on guarantee that it will do what is claimed for it.

Lindburg Garage Door Control

The Lindburg Garage Door Control, is a device that is secured to the top of upper portion of the door that serves as a lock when the door is open. When in the open position this devise insures the door to be securely locked, thereby eliminating all danger of being blown shut while the car is entering the garage which so often causes broken fenders, lamps, etc. With this device both doors are operated as one. By opening one door the other door is automatically opened. Only five screws are necessary to install the Lindburg lock and it is not necessary therefore to resort to any expensive carpenter work in order to install the lock. A chain freely can be attached when the doors are to be closed. This device is made by the J. F. Lindburg Co., Chicago, 501 North La Salle Street.



Peters crankshaft grinder

Peters Crankshaft Grinder

The feature of the Peters grinder is that it is so constructed that it removes only the high spots on a crankpin that is out of round, thus saving metal in the shaft with a resultant greater strength and considerably reducing the necessity for rebabbitting. The tool is split and hinged so that it can be put on and taken off the pin and the cutters are operated by a screw plate which moves all of them in or out at the same time and the same amount. There are eight silver steel cutters which are ground at the ends to allow for the fillet and the cutters to extend far enough to prevent chips from clogging and scratching the surface of the pin. Price $75.—Aluminum Brazing Solder Co., 1303 Widener Bldg., Philadelphia.

Service Managers' Letters



Wherein Is Shown Some of the Major Difficulties the Factories Must Contend With—Dealers Too Often Careless In Ordering Parts — Much Detail Work Can Be Eliminated

Stock Room Big Asset in Service According to Briscoe Manager

WE furnish our dealers with a standard parts order form, but in many instances the dealer in ordering parts fails to give us all of the information we ask for on this order. We refer particularly to the part number, model number and motor number. Where do we not receive this information it naturally necessitates a great deal of delay in writing to the dealer and awaiting a reply, and in the meantime in some cases, of course, where the dealer is entirely out of the part desired it holds up the delivery of the customer's car.

There is one thing very necessary and that is for the dealer or distributor to have as high grade a stock man as it is possible for him to obtain. A great many dealers do not appreciate the importance of the stock room as an asset in selling cars. It is also very important that a card system be maintained in the stock room in order that the parts can be ordered before the stock is entirely out.

In the matter of returning parts and credit claims, we have found it is very difficult to get the proper information on returned parts as to the number of the car and the owner's name of the car. If the dealer will give us this information it certainly will tend to speed up the closing of all claims without the delay which is necessary where we have to write for this information.

The dealer should appoint a competent man to pass on all parts before returning them to the factory. We receive a great many parts, which are returned as defective, and upon inspection here, they show absolutely no defect. It would be better by far for the dealer's inspector to immediately advise the customer when a part is removed from his car or brought in to be returned to the factory, that there would be no chance of credit being issued by the factory if the part was not defective, rather than to return the part to the factory and leave the owner under the impression that credit will be allowed. It is therefore, apparent that a high grade man should be appointed by the dealer. If every dealer would have a man of this kind, there is no question but what it would naturally cut down the amount of parts returned to the factory for credit.

We believe that one of the most important things for the dealer to consider for the coming season is the improvement of his service. We believe there is no question but what the successful dealer is one who maintains an up-to-date service station and is at all times in a position to promptly take care of the owner in the way of repair parts, and furnish repair work by competent mechanics, and all live dealers are we know, paying more attention each year to the service end of the business, for if it is handled properly the service department is not a liability but an asset.—J. R. Blythe, Briscoe Motors Corp., Jackson, Mich.

Dealers Must Build Up Parts Stock This Year, Says Saxon

AUTOMOBILE dealers, when representing lines well established with numerous cars in the field, find that the parts service department of their business is a very profitable line when handled properly. Proper handling can be attained by carefully guarding the efficiency of the perpetual inventory card. A strict rule must be maintained as to the number of months' usage, which is shown on each card, as this constitutes the maximum amount to order. The minimum, which is also shown, should be high enough to permit delivery of the order the cheapest way.

It is easy for the factory to know dealers who overlook the necessity of maintaining such a system. During the rush season dealers of this type overwhelm the factory with telegraphic orders. These telegrams are not only an added expense to someone, but they cause errors, cut into the profits and lead to unpleasantries with the factory service department, often through the fault of the telegraph company. If the telegram is not clear, the factory inferring that the matter is expedient, inquires by wire, which is often sent at the expense of the dealer, for if the factory were to prepay all telegrams of this nature, it would amount to several hundred dollars a day.

The service department of the Saxon Motor Car Corp. endeavors to ship all orders within 12 hrs. of receipt of the order at the factory. In order to maintain this standard of service, it is necessary for us to expect co-operation from our dealers' service departments. This would consist of sending the order in typewritten form on order sheets, such as are supplied by the factory, and also accuracy in specifying the symbol number, name of the parts, the model and serial number of the car.

In returning surplus stock, ordered in error, the dealer should use the forms supplied by the factory, stating clearly the invoice number under which these parts were received. This will enable the factory to credit the dealer according to the prices at which he purchased the parts. Parts which appear to be defective, replaced on cars within the guarantee period, should be returned to the factory in the same manner, excepting the invoice which the dealer will give, will be the invoice covering the replacing parts.

We read statements from the big men of the industry calling to our attention that the demand for automobiles will exceed production by over one million. The present condition of the material and labor market prove this statement to be true. If the manufacturers cannot obtain parts enough to present the automobile in assembly, is it not possible that it may be difficult to obtain certain parts for service?

The most important thing for the dealer to do this year is to build his parts stock up to the maximum and prepare for the rush season. In doing this, he will retain the good will of the man who has already purchased a car from him. This undoubtedly will be a valuable asset when that year comes, which will bring the production of automobiles up to the demand.—J. A. Hickey, Saxon Motor Car Corp., Detroit.

Service Most Important and Least Considered, Says Packard

THE dealer can actually secure more prompt part service from the factory and in that way decrease his overhead and increase his satisfaction to his customers if he will order parts strictly in accordance with the factory recommendations. Some of these recommendations ars:

Send in orders to the factory only on the regular order blank furnished by the factory for that purpose, taking care to fill in the headings completely and accurately, giving special attention to the method by which the order is to be shipped—that is, parcel post, express or freight.

Specify quantities of parts only in accordance with actual requirements, based on his rate of consumption.

Give the correct piece number in every case. This is only possible if an accurate record is kept by the dealer, incorporating changes made from time to time by the factory.

Specify the correct name of the part, being very particular to include items such as right or left, front or rear, large or small, etc.

Avoid telegraph orders as far as possible by anticipating stock requirements, and when telegrams are sent, confirm them by mail on the regular parts order blank, marking it confirmation. When sending telegraph orders, use night letters as far as possible, giving piece number by spelling out the number, and carefully avoiding possible confusion between the number of the quantity desired and the piece number.

Dealers can assure receiving prompt attention on goods returned on claim for credit, and will also assure themselves a maximum of favorable consideration on credits if they will follow carefully the factory instructions in regard to the routine of this business. Some of the important points to be observed are as follows:

All material returned should be thoroughly cleaned of all grease and oil before returning.

A claim tag filled out completely in accordance with factory's instructions should be attached to each piece.

Factory parts return form should be filled in completely with cross references, giving the number of the claim tags for all parts returned and including all the necessary information as to why the return has been made. At the Packard factory we recommend supplying all claim information on these forms, rather than by accompanying letters of explanation.

A record should be kept and carefully checked up when the factory disposition has been received, so as to assure a thorough understanding on the part of the dealer of the exact status of all his claims for defects at all times.

Pack and box all material so as to assure against damage in transit. Prepay all transportation charges and ship according to most economical route.

When material is returned for repairs, keep it separate from material returned for credit. Also keep new stock return separate from stock returned on claim for deficit.

When material is returned on claim for defect, always give vehicle number, owner's name and address, date of delivery of the new vehicle, and the date of replacement.

Return parts regularly and as frequently as the volume involved warrants.

Distributors can help themselves and the factory by returning for credit only such parts as their experience indicates may reasonably be expected to receive favorable consideration. If the factory policy with regard to the basis upon which are creditable is definitely established, it should be possible for the distributor to know in advance whether material is creditable or not, and make his decision with the customers in advance of the return of the material to the factory. This is a great advantage in assuring prompt collection for repairs and avoiding misunderstandings with customers. Many of our distributors obtain credit for from 95 per cent to 98 per cent of the material returned for credit.

With regards to standardization for service of routine methods and equipment, we believe that great progress in service throughout the country can be made in this way. While the character of the vehicle purchasers may vary slightly in different parts of the country, in general the conditions warranting the rendering of efficient service are the same all over the country. Consequently, there is only one best way to render this service — and the problem is simply to find out what this one best way is with respect to all phases of our service work, and then standardize upon that method. We have already made considerable progress in this direction, and expect to continue in the future this important work.

Some of the things which have been standardized for Packard service stations are:

The entire paper routine and the methods of handling all repair work have been standardized in a system known as Packard uniform service repair methods.

The entire stock room routine has been standardized in a system known as Packard uniform stock keeping records.

The detailed service principles and policies have been standardized in a booklet known as Packard service principles.—H. W. Drew, Packard Motor Car Co., Detroit.

THIS year is going to be "Service year" if the thoughts expressed on these pages by service managers of several motor car factories is indicative of what is uppermost in the minds of the service departments of manufacturers in the while automotive industry.

It is not unreasonable to state that service, by which we mean that phase of the industry which maintains the product, in other words, keeps it in a condition approximating that when it left the maker, soon will be put on a level with production and sales.

There will be service organizations that will surpass sales organizations. It is a big job to keep a product sold. That is the job of the service organizations.

There are two angles to service—factory and dealer. The factory must do its part in the way of designing and building a product for easier maintenance. It also must standardize service and repair work systems so that approved methods for doing any particular job in the shortest time possible may be adopted. These methods must be flexible to some extent, so the dealer in a city of 2,000 can carry on service as effectively thereby as a dealer in New York or Chicago.

The dealer must do his part by following out the schemes laid down by the factory, because the factory, theoretically at least, knows more about the way its product should be handled. A vast amount of time is lost each year by dealers who are careless in attention to details, using the return parts blanks, or other factory forms. Incomplete data, vague telegrams usually sent in the rush season, wrong engine numbers, etc., retard service, make customers dissatisfied and keep the product from remaining sold.

The dealers' parts department is going to play a big part in service and can be made profitable by watching the perpetual inventory card. An adequate stock is necessary, but care must be taken not to stock up on parts for which there is little call. The number of cars in a territory, future sales possibilities, and similar things are factors in determining the extent of the parts layout. The factory knows what parts are apt to wear quickest, and can guide the dealer in his selection. The time may come when every dealer will be required to lay in a certain stock of parts for every car, truck or tractor purchased from the factory. This is done now in some instances.

The path upon which efficient service must be conducted has been pointed out to us, but the road first must be cleared and prepared. There is the shortage of mechanics problem, difficulty of getting cars and parts, and other equally important things. Hope for a solution to many of them lies in the service schools being put on by some makers, by labor saving equipment, better building layouts and more thought toward the idea of diplomatically and intelligently selling service.

Sales Managers' Letters



Not to sell cars but to get them to sell, to build up organizations this year which will prove themselves in other years when more sales resistance is to be encountered, these are the problems which confront dealers this year according to the sales managers of some of the leading motor car manufacturers throughout the United States. MOTOR AGE asked for expressions of opinions from these men concerning th probable state of the industry for the coming year and with a singular unanimity, they agreed that production this season could not possibly keep up with demand.

Under these circumstances, many of them pointed out that dealers should build up their organizations, particularly their service organizations. Some of them did not take the viewpoint of MOTOR AGE that the service departments should be made to keep up the curve of profits which might drop on account of inability of dealers to get cars to sell. But all of them did point out that service departments should be improved and strengthened either for themselves or as an aid to merchandising.

GRANT MOTOR CAR CORPORATION
MANUFACTURERS
GRANT SIX MOTOR CARS | GRANT MOTOR TRUCKS
CLEVELAND, OHIO

The real dealer problem of the ensuing year will be to supply sufficient cars to take care of the demand and to lay the foundation for future business which will carry him through a future condition of affairs when good business will not be as easy to secure as at present.

From the service standpoint, the dealer's problem is competent, honest, faithful help. If he can secure this, together with a first class service manager, he will, indeed, be fortunate.

The dealers of the United States have gone through a tremendous crisis in an unusually creditable manner. Their difficulties and their woes have been innumerable and I believe that a wonderful future lies before the dealer who is alive to the necessity of placing his business on a firm, well-financed basis. In other words, the man who sets his house in order for the inevitable competition of normal times need have no fear as to his future. - - George S. Waite, Director of Sales, Grant Motor Car Corp.

AMERICAN MOTORS CORPOR
CAPITALIZATION $2,250,000
141 BROADWAY
NEW YORK
FACTORY—PLAINFIELD, NEW JERSEY
ROBERT GUNSHER

Perhaps the problem which stands out most prominently for dealers this year is the used car problem. With the ever increasing production of motor cars, the question of the disposition of the second hand cars becomes more and more serious and it rests with the industry to establish a system which will take care of the thousands of used cars which are thrown upon the market annually.

More parking facilities must be found in the cities for automobiles. The number of cars is becoming larger and the traffic conditions more congested, which makes it practically impossible for an automobile owner living in the outlying districts to drive his car to business in the city and leave it with any degree of safety in the streets. The present parking conditions in American cities as handled by the police departments are by no means satisfactory. If the police departments cannot sufficiently handle the automobile traffic, another method of handling it must be found.-- L.J.Collopy, General Sales Manager, American Motors Corp.

STEPHENS SALIENT SIX

At this time it looks as if the spring demand for motor cars, trucks, tractors, - for every sort of automotive product,- would far exceed anything the United States ever has known. Even if the domestic demand falls short of what even the most conservative expect, however, the foreign demand will absorb all the cars American manufacturers can possibly produce in 1920.

As to the price situation, it would be foolish to hazard a prediction. Materials and labor are still advancing and while a policy as a whole may be pre-determined, circumstances are almost certain to alter it to some extent.

Dealers can improve their opportunities by rounding out their organizations, weeding out the weak individuals and departments and strengthening every department for the pull that is to come. Their real problems this year are to solve the problems of the future. They should perfect their organizations while the sales demand is strong, take time to think of the future and build a compact, efficient organization which will be adequate to the needs of the future. -- C.Roy Clauch, Sales Manager, Stephens Motor Works.

ADDRESS ALL COMMUNICATIONS TO THE MAIN OFFICE AT DETROIT

Hupmobile

MANUFACTURING PLANTS
DETROIT, MICHIGAN
JACKSON, MICHIGAN
WINDSOR, ONTARIO

CABLE ADDRESS
"HUPP DETROIT"
LIEBER'S A.B.C. 5TH ED.
WESTERN UNION CODE

The Mark of Superior Motor Car Service

Hupp Motor Car Corporation

Detroit, Michigan, U.S.A.

The farsighted dealer should prepare for future conditions in the automobile industry as they may be within the next few years when efficient salesmanship rather than mere order taking will be a requisite to success. He can do this by strengthening his service organization, by maintaining a cleaner and better establishment and by putting his business on such a basis that he will be in a position to meet closer competition and lessened demand. Now is the time for the dealer to strengthen his organization, - when his sales are virtually taking care of themselves.

I believe that the sales problem for this year will almost work out itself, for I think there is bound to be an increasing demand. There is a shortage of cars right now and this shortage will increase for several months due to the fact that the per capita wealth of the United States is much greater than it ever was before and is growing, especially in the agricultural districts.

Prices are still unsettled but there is an upward tendency. In this connection, it might be noted that, whereas in the last four years the price of clothing, foodstuffs, etc., has increased more than 100 per cent., the price of motor cars has advanced only 40 per cent, and this in the face of the fact that production has increased only 16 per cent since 1910.--H. C. Hutchinson, General Sales Manager Hupp Motor Car Corp.

THE COLUMBIA MOTORS CO.

MANUFACTURERS OF THE

Columbia Six

DETROIT, U.S.A.

Price situation a problem

It is impossible at this time to determine what motor car prices will be for some time to come. Manufacturers must vary their prices to absorb price increases which are forced upon parts manufacturers and until these parts manufacturers are able to determine future prices, it is obviously impossible for the car manufacturer to do so. We have just announced an increase of $130 on open models and $45 on closed car. Between this announcement and our last price raise, we have been forced to absorb no less than three increases in the price of our engines, increase in the price of the transmission we use and other increases on axles and other parts we buy.

Because of this tendency toward higher prices and because the demand for new cars in 1920, I believe, is going to be unfillable even with increased production. I believe there will be a great market for used cars for the coming year. This should interest dealers, for the sale of these used cars should keep their profits at a high peak, despite their probable inability to get enough new cars to fill all their orders.

Good used cars are sure to bring good prices, and it is up to the dealers to sell the best cars they can. By this I do not mean that they must sell only high priced cars, but I do mean that they can make best profits for the present and build up the best sort of clientele for sales in the future by getting the used cars they sell in the best possible condition and keeping cars in good condition once they are sold. They have a wonderful opportunity to make their service stations real salesrooms and their service work a real salesman this year. W. L. Daly, Sales Manager, Columbia Motors Co.

CROW-ELKHART MOTOR CORPORATION

ELKHART, INDIANA

The well financed dealer who can meet his obligations promptly is sure to have a big advantage over his rivals in the industry this year. I believe the demand for cars is going to be heavier this year than it ever has been in the past, while the production cannot possible keep abreast of the ever-increasing shortage. Dealers will have abundant opportunity to show that they are real business men in 1920, - although the results may not show until later. It may seem that everything is going to be easy and prosperous for the dealer this year, as it undoubtedly will be, but the real dealers, the real business men among the dealers will be the ones who build for the future.

As regards prices, I think any predictions on this question are out of the line. It may be that prices will remain where they are, they may go up and they may go down. The state of the labor and material market just at present, however, is such that it is utterly impossible to make an intelligent surmise as to what the next few months is to bring forth. Dealers should bear that in mind and realize that their own efforts, not those of anyone else, are going to be the determining factor in the success of their future. E. H. Closson, Advertising Manager, Crow-Elkhart Motor Corp.

PAIGE-DETROIT

MOTOR CAR COMPANY

MANUFACTURERS

DETROIT, MICH., U.S.A.

HARRY H. JEWETT, President
FREDERICK L. JEWETT, First Vice President
GILBERT W. LEE, Treasurer
WILLIAM B. CADY, Secretary
W. A. WHEELER, Vice President, Production Division
HENRY KROHN, Vice President, Sales Passenger Car Division
CHAS. S. PIKE, Vice President, Sales Truck Division
T. BRADLEY, Vice President, Purchasing Division
A. DATNEL, Vice President, Engineering Division

"When at War, prepare for peace"

Wise dealers will start preparing now for a sales resistance which is bound to come sometime, whether in the near or the distant future. The conditions of 1919 and 1920 cannot continue for ever. There will always be a big market for cars, but dealers must train their selling organization so they are ready to go out and sell, not merely to take orders. They can do this by building up their service department so that they have a regular clientele, a clientele which knows that the dealer did not slight it in his days of highest prosperity and which will be prepared to stick by him when he sales work is a little more difficult.

There will be a steady demand for cars all through the summer and I do not believe that production can be speeded up sufficiently to meet the coming demand. In the fall I believe we shall begin to meet a little of the old time sales resistance, but if the dealer has done his duty by his customers, I don not believe he has much to fear on that account. H. Krohn, Vice President, Sales Passenger Car Division, Paige Detroit Motor Car Co.

PREMIER MOTOR CORPORATION

MANUFACTURERS OF

PREMIER MOTOR CARS

INDIANAPOLIS

For the next four months, cars will practically sell themselves. After that better salesmanship by men better educated in the product they are selling than is the rule at present, better advertising and more intelligent servicing, will be required to sell cars.

I believe that far from meeting the accumulated demand, the number of cars which can be produced in 1920 is going to have a hard time meeting the current demand. I believe that demand is going to be ever increasing, at least up to the early fall months. The spring demand is apparently extremely good and I believe this will hold despite a general raise in prices which I believe is to be inevitable within the next five months.

There is no question about the prosperity of this country and good business conditions are certain for the next three years. Dealers, however, must anticipate their requirements and keep their stock in such shape as to meet any demands which may be made upon them. ---- E. W. Hurd, director of sales, Premier Motor Corp.

CABLE ADDRESS
WESTERN UNION CODE
"TEMPLAR"

ADDRESS ALL REPLIES TO STATION B

THE TEMPLAR MOTORS CORPORATION

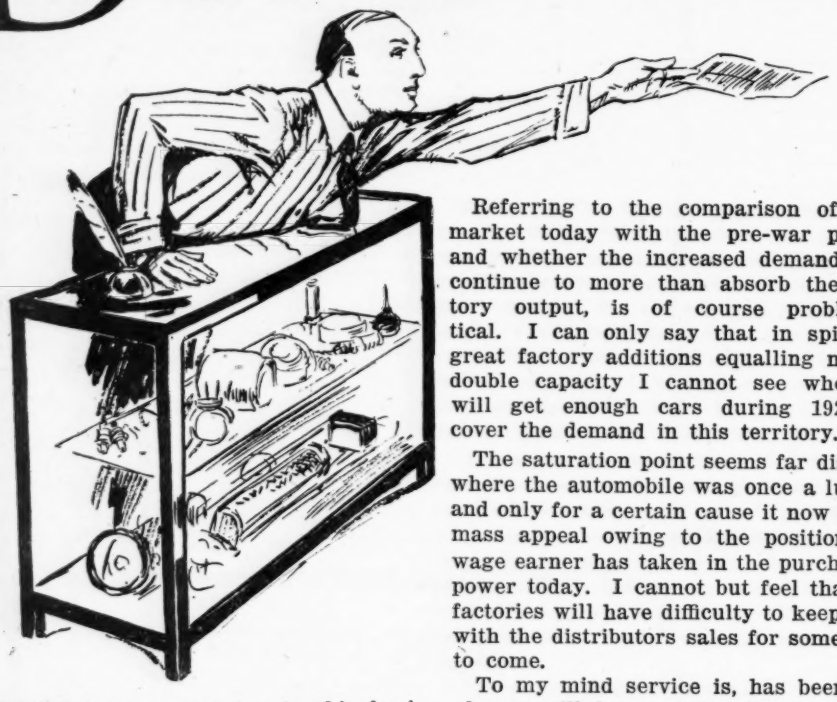
CLEVELAND

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J. S. MATHEWS, Secretary
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H. C. PETERMANN, Comptroller
W. O. COOPER, Assistant Sec.

Servicing will be important.

Many dealers do not seem to realize that their obligations do not cease when a car is sold but is only beginning. Proper service, within reason, is requisite, and it should be the sort of service which will make friends of customers and bring them back to the dealer to buy further service work when it is needed but for a new car when the time comes. Dealers should, at this time build up a stable, legitimate commercial business without frills, with proper service one of the principal stones of its foundation. Harry W. Anderson, General Sales Manager, Templars Motor Corp.

Dealers Letters



DURING my experience in this business, which covers a period of fifteen years, I have seen the automobile industry grow to its now mammoth proportions. There have been years when we were in position to supply the demand having a surplus stock on hand but those years are certainly a thing of the past.

Never in my experience have I felt so strongly that the present demand at this time of year, our dull season so called, forecasts a tremendous call for spring deliveries of cars.

Advertising and sales effort are both directed to admonish our customers and prospects to protect themselves by placing orders early. I believe that the buying public has felt that a great deal of our publicity was to secure orders rather than a sincere warning that we are to be again oversold. They are commencing to realize the truth and are buying now to insure themselves a car for later delivery.

The automobile show results in New York show the percentage of new buyers over trade-in sales to be much larger than it has ever been before. However our used car business is increasing. Many of our owners continue year after year to turn in their cars for new ones. Many people who have been unable to secure new cars owing to uncertain deliveries buy used cars until their new ones arrive. Others make a practice of buying only used cars and our used car department, occupying a complete display room of its own, is showing an increase in business month by month. It is my feeling that used car sales will also be on the ascending scale throughout the year.

Referring to the comparison of this market today with the pre-war period and whether the increased demand will continue to more than absorb the factory output, is of course problematical. I can only say that in spite of great factory additions equalling nearly double capacity I cannot see where I will get enough cars during 1920 to cover the demand in this territory.

The saturation point seems far distant, where the automobile was once a luxury and only for a certain cause it now has a mass appeal owing to the position the wage earner has taken in the purchasing power today. I cannot but feel that the factories will have difficulty to keep pace with the distributors sales for some time to come.

To my mind service is, has been and always will be a vital selling point in this business. I believe a satisfied customer is the best advertising obtainable. I think this statement is fully justified—our service station is built to meet this belief. As long as human nature obtains there will be unreasonable claims. Such claims are given due consideration. One of our service problems is the educating of the car owner to bring his troubles to us and not to the shopman who poses as a specialist in repair work on our cars. We have had one or two instances where our trade name has been taken by unscrupulous shops advertising as our service stations entirely unauthorized by us and has resulted in our owners getting inefficient workmanship and excessive labor charges.

It seems to me some active propaganda against the misuse of company names by unauthorized repair men would be advantageous to the automobile trade in general.—Harry S. Huift, Hudson Motor Car Co., Hudson distributors, New York.

Sees Big Demand on Pacific Coast

IT becomes increasingly evident that the dealers in this territory are facing a shortage of both passenger cars and trucks for spring delivery and the wise ones are stocking up as fast as their factories are able to deliver. The demand for second hand vehicle was never better, and we look for a material increase in the demand as the season progresses.

Our greatest problem in the service situation is securing first class mechanics, but this problem is being solved as the good men are released from the service, and we hope before spring to have our organization built up to a point where we will be able to render efficient service.—Harry Twitchell, Manager, The John Doran Co., Packard Essex and Hudson distributors, Spokane, Wash.

Increasing Prices Will Not Hurt Sales

WE do not believe that the increasing prices on passenger cars will have any great effect on the sales, at least for the spring deliveries. The labor situation, of course, is very serious and while this may affect manufacturers, the high wages are sure to aid the dealers. We believe that there will be a greater demand for motor cars this spring than there was in the pre-war period and that the increased and available output of the factories will promptly be taken care of.—W. D. Block, W. D. Block Motor Co., Marmon distributor, Detroit, Mich.

Cash Basis Aids Service Department

IN 1917 we placed our entire service and parts department on a cash basis, and this has been a tremendous advantage to us. In fact, up to the present time, we have not had to increase our labor charges so far as the hourly rate is concerned because we have been able to work on a very close margin due to the fact that we are on a cash basis and we use this constantly in answering questions from our customers as to why we changed from a credit basis to a cash one. Invariably they can see the point and appreciate the fact that it has been just as much for their advantage as our own.

Service, as I see it, is always a big problem. First, there is the need of enormous space, and when we stop to think that this space is built or rented for the purpose of taking care of cars which are already sold and not for the ones we are going to sell, it means that when we have a vast number of cars in use that the burden of building service stations of sufficient size properly to take care of our customers is a very great one. Then again there is always the problem of labor. We find it extremely difficult to employ mechanics who will do work properly and we are constantly on the outlook for means to increase their efficiency. Even with the heads of the service department we have difficulty in instilling the idea of courtesy and honesty to the customers two points which are extremely important to the proper conduct of a service organization. —Tom Botterill, Hudson distributor, Denver, Colo.

Calls Service Problems a "Thing of the Past"

SERVICE problems are practically a thing of the past. We seem to have this worked out quite satisfactorily ourselves and we do not believe the average dealer of today is confronted with the problems along this line he was a few years ago. The dealer who considered the automobile business as a game has automatically eliminated himself, and the man who has taken it as a real serious business and operated accordingly, has made it a success.—E. H. Baker, Cole Motor Co., Buffalo, N. Y.

Must Sell Trucks This Spring

THE spring demand for new passenger cars, trucks and tractors shows every evidence today of being far in excess of the previous spring. Today most of our dealers have orders and deposits absorbing their passenger car allotment covering a period up to June 1.

Trucks will have to be sold. The present truck manufacturing schedule will not care for the business, and prospective truck owners will find an oversold market by May 1.

We can see no new problems to face dealers this spring. However, there are many important old problems which retain their sting, although many dealers seem to have forgotten them. Service is most important. Care in trading so that the dealer is assured of a profit must be exercised and last of all the dealer should remember that he and his organization are dependent on the public rather than taking the present attitude wherein the dealer seems to feel that the public is dependent upon him—Graham Grimley, Del-Mar-Va-Nash Motor Co., Salisbury, Mo.

ST. LOUIS MEN COMBINE

St. Louis, Jan. 26—A real start toward the organization of the Automotive Industries Association of St. Louis was made at a dinner party at the Planters Hotel recently, when members of the five organizations representing every branch of the motor car trade met for the first time. Women were present, and there were many unusual features in the delightful entertainment arranged by Capt. Robert E. Lee, secretary of all of the associations.

Capt. Lee presided. The entertainment began with the presentation of what he called "The Famous and Rare Animal, the Hellydid," brought by him from the Philippines. After considerable mystery, the animal hatched from an immense egg proved to be only a negro boy. The spirit of St. Louis appeared and wished the members a prosperous 1920.

Short talks indorsing the idea of one big association were made by Phil H. Brockman, president of the St. Louis Automobile Manufacturers' and Dealers' Association; W. L. Ferrier, president of the St. Louis Accessory Trades Association; L. H. Amrine, chairman Commercial Car Bureau; Harry Spoeneman, president Battery Trades Association, and Joseph Roberts, president of the newest organization, St. Louis Tire Dealers' Association. Mr. Brockman also urged that all members write to their congressmen in support of the Townsend Good Roads bill.

Paul V. Bunn, general secretary of the St. Louis Chamber of Commerce, pledged the support of the Chamber to the members of the various organizations.

Gus F. Schlecht, vice-president of the Memphis Automobile Dealers' Association, spoke of the benefits of organization. He is the Dodge distributer there. He is a former St. Louisan, the brother of Joseph A. Schlecht, Gardner, Allen and Gardner distributer here.

During the dinner there was a lively cabaret. They took on holiday airs, when paper caps and all sorts of noise-making souvenirs were passed around. Streamers of varicolored paper were thrown about the room. The room had been decorated with white latticed arches covered with smilax. Dancing ended the evening.

More than 300 guests were present, and half of them were ladies. It was the first time that any of the associations, with the exception of the accessory men, had invited the ladies to any of their gatherings.

BUFFALO RE-ELECTS OFFICERS

Buffalo, Jan. 27—All former officers of the Buffalo Automobile Club, the largest city federation of motorists in the world, were re-elected at the annual meeting of the directors. The officers are:

Howard M. Heston, president; Charles Clifton, vice-president; Charles L. Couch, treasurer; Dai H. Lewis, secretary. More than 2000 members joined the club in 1919 and the present membership is more than 6000.

Directors of the club are Edward H. Baker, C. Walter Betts, Mazwell M. Nowak, Arthur T. Danahy, Edgar C. Neal, George Ostendorf, Harold J. Balliett Robert S. Weed, William E. Robertson, Robert L. Crane, James B. Wall and Henry S. Norris.

TALKS ON THE USED CAR

CLEVELAND, Jan. 28—Timothy D. Beard of the Chicago Automobile Trade Association addressed the regular monthly meeting of the Automotive Association of The Cleveland Chamber of Commerce on "The Used Car" and also made some very interesting remarks on the Used Car Market Report, on which Mr. Beard is considered an authority. The meeting was well attended, some twenty used car dealers being in the audience. The after meeting with Mr. Beard and a few of his more interested auditors lasted until nearly four o'clock, although the meeting proper was held at a noon luncheon.

A resolution was passed instructing the secretary to circularize the membership urging them to conspicuously label wood alcohol or denatured alcohol containers prior to sale with the word "poison." If every trade association throughout the country were to immediately take similar action, we believe that it would go a long ways toward reducing the number of deaths and cases of blindness caused by the ill-advised used of this poison.

OHIO DEALERS TO ORGANIZE

Columbus, Ohio, Jan. 24—Elber Shover, the new secretary-manager of the Ohio Automobile Trade Association, has started on an active campaign for membership, especially in organizing local associations to be affiliated with the state organization. During the past week he met with leading dealers and garagemen of Toledo with a view of combining the two associations of that city into a Toledo Auto Trades Association. There are at present a Toledo Dealers' Association and a Toledo Auto Trades Association. Many of the members of both organizations were interested in the project to combine the two organizations and another meeting will be held soon to bring about the merger.

RE-ELECT BATTERY OFFICIALS

St. Louis, Jan. 28—All of the old officers of the St. Louis Storage Battery Trade Association were elected at the annual meeting at the American Annex Hotel as follows: President, H. E. Spoeneman; vive-president, W. E. Fuetterer; R. G. McCurdy and W. E. Moershell, directors. A new office-sergeant at arms was created, and A. A. Gates of East St. Louis named.

TRANSPORT CORPS AT SHOW

Washington, Jan. 23—The Motor Transport Corps will hold an exhibition in conjunction with the Chicago truck show at the invitation of the National Automobile Chamber of Commerce. The exhibit will contain some added attractions in addition to the features that created such attention at the recent New York Show.

A special exhibit of disassembled German truck parts have been forwarded from the Motor Transport Corps Experimental Station, Bureau of Standards, Washington, D. C., consisting of:

Shaft and bearing from union truck.

Transmission and differential from union truck.

Steering column from Stoewer truck.

Ring gear and worm assembly from Karl Schmidt truck.

Brake shoes, extra.

Thrust bearing and differential bear (411E) (1114 K.V.) from Podeus truck.

Rear wheel sleeve.

Double roller wheel bearing.

Pinion and reduction gear (used on 3-ton truck).

Opel motor complete.

A standardized class B truck and a display of photographs will complete the exhibit which will be in charge of Major F. C. Hecox, assistant to Col. H. A Hegeman, Motor Transport Officer, Central Department.



EDITORIAL



Darwin S. Hatch

This is a tribute to Darwin Hatch from those who knew him most and knew him best, his associates of the Editorial Staff of Motor Age.

For we were his associates in the true sense of the word. There was no feeling of working under Mr Hatch or working for him. We were working with him to make Motor Age a better paper and to make the automobile industry a better industry. He was our leader and our companion in that work, not our taskmaster. His unflagging enthusiasm, his untiring energy showed us the way when we might have faltered.

In the death of Mr. Hatch we have all lost a friend The automobile industry has lost a man which it can ill afford to lose.

This must not be our final tribute. Our real tribute must be in faithfully carrying on the work he taught us to do and to help, so far as lies within us, to make the automobile industry worthy of the name he so proudly bore,—American.

The 1920 Shows

WHAT struck you most forcibly about the New York and Chicago Automobile Shows this year as compared with those of previous years," we asked a dealer who had attended both exhibitions.

"THEY struck me as being ideal from the viewpoint of the manufacturers, but not quite so excellent from the viewpoint of the dealer who expects to sell cars through a show or from that of the man who attends the show for the purpose of buying a car," was the response. "The manufacturers showed their stock models, their stock bodies, and the dealers who attended the shows have a very excellent idea of just what the 1920 automobiles will be. For the visiting dealer, the shows could not have been improved upon much.

"BUT I don't know how they are for the dealers of the cities in which they are held. There is no gainsaying that the national shows are a tremendous advertisement for the automobile trade. The shows focus attention on the motor car industry. Everyone in Chicago seemed to be interested in the show; either intending to do to it or sorry because he was unable to do so. That showed me there was a tremendous market for the dealer in those big cities.

"HOWEVER, compared with the shows of 1919, which were put on by the dealers themselves, there seemed something lacking. The stock bodies are undoubtedly attractive, but there was lacking in this year's show some of the color, some of the artistic which was present at the shows of 1919.

"FROM the dealer's service viewpoint, the thing which struck me most forcibly was the increased attention being made to accessbility of cars to facilitate servicing. The exhibit made by the Marmon company in which an engine is completely torn down and reassembled in little more than an hour is an example of the attention makers are devoting to making their products easy of service while scarcely any maker but devotes considerable time to this problem."

Sell Your Other Item of Merchandise

WHEN the first class business man, who is a merchant, finds that one item of his merchandise is failing him, that he cannot get a stock of one particular thing he sells, he does not sit back and commiserate with himself on his bad luck. Instead he goes out and pushes some other article of merchandise.

THAT is what the motor car dealer must do in 1920. It is almost certain that he cannot get enough new cars to meet his demand. The agreement on that subject is almost unanimous. He must keep his curve of profits up by selling another article. And the best article for the automobile merchant to sell is one of whose output he himself is in complete control.—Service. He can do this if he tries.

SHORTAGES of cars may come, shortages of trucks may come, shortage of tractors may come, but there can never be a shortage of service for the automobile dealer. The supply of Service is limited only by the dealer who offers it for sale. He can produce as much Service as he wants.

This is the year when you should build up your Service Departments. When the summer draws to an end and the shortage of cars becomes more and more acute, the man who has built up a Service Department to carry the load of his expenses and pay him a profit into the bargain will be the wise automobile man.

Darwin S. Hatch, Managing Editor of Motor Age, Dies Suddenly of Pneumonia

BY DAVID BEECROFT

(Directing Editor, Class Journal Co.)

DARWIN S. HATCH, Managing Editor of MOTOR AGE died of pneumonia at his home, 616 West 71st street, after a brief illness of one week. He returned from the New York motor show suffering from a severe cold and two or three days spent in his office served to give pneumonia a chance to develop. His death came just a week after he was confined to his home, occurring at midnight, January 20.

Funeral services were held Friday, January 23, at his boyhood home, Kentland, Ind.

Darwin Hatch's professional life was practically all devoted to the interests of motoring most of it with MOTOR AGE, having associated himself with its editorial department in October, 1909, just three years after he graduated from Purdue University with the degree of B. S. The interval of three years between his graduation from purdue in 1906 and his coming to MOTOR AGE was largely spent in literary work. He was an instructor in the American School of Correspondence and edited some of its books. At this time he was also a contributor to the Technical World, a magazine that devoted much of its effort to engineering and technical subjects.



Mr. Hatch's early work with MOTOR AGE was almost entirely of an engineering and technical character until his becoming Managing Editor.

Beginning with his high school days in Kentland, where he graduated from the Kentland high school in 1902 his education and professional life paralleled the great development of the motor car industry in America, and like so many college men of his day he cast his life lot with what has come to be the great industry of the century.

Since 1909 his entire life effort was with the motor activity of the country. There is scarcely a phase of it that he was not more or less continuously associated with. As a graduate engineer, specializing in electrical work, he took unusual part in the technical development of the motor car, his most recent achievement in this respect being the joint editorship with Prof. W. C. Moreton of Armour Institute, Chicago, of a book on Electrical Applications in the Motor Car which appeared serially during the past two years in the columns of MOTOR AGE.

When the midwest section of the Society of Automotive Engineers was established in Chicago four to five years ago, he was appointed secretary and held that post until a year ago. He was a leader in the activities of the society in the middle west, devoting a great deal of his time to the organization.

There was scarcely a motor contest of any character held in the middle west that the technical services of Darwin Hatch were not required. He was a perennial member of technical committees on such contest classics as the Indianapolis speedway races, Elgin road races, endurance runs and many technical tests of individual manufacturers who desired a special rating on their apparatus. During the past year he has been secretary of the Chicago Automobile Club of which he was a member for several years.

Darwin Hatch by his wholehearted and unselfish application to the almost numberless activities of the motor industry stood out as that type of self sacrificing American who placed the general promotion and development of the industry ahead of personal ambitions. His life was a continual devotion to motoring. His affable disposition and willingness to share the load placed many a burden on his shoulders, that only those closest to the industry will ever appreciate. He never shirked his own responsibilities or withdrew from what he considered the general problems of the industry.

Darwin Hatch was a son of Jethro and Sarah M. Hatch, Kentland, Ind., and was born in that town February 19, 1883. In June, 1906, he married Vivian Prendergrass of Kentland. Three children, Dorothy, age 13, Virginia, age 10, and Darwin, Jr., age 7, survive him. He is also survived by his mother, Sarah M., and his only sister, Mrs. Steele, of Knox, Ind.

From his father, who was a civil war veteran, he inherited a deep rooted military sense and died a member of the Loyal Legion. He was a charter member Theta Xi.

For some time he was a member of the good roads division of the Chicago Association of Commerce and always counted the development of highways as one of the dominant problems of motor development.

Darwin Hatch's influence for motoring will live. His analyses of conditions were always fundamental. He was a discerning observer of the course of motoring events. He saw motoring in its broader aspect. His view was not that of a local analyzer, but his eye was invariably turned to the national aspects of the industry.

His death came as a great shock to his friends, for he had enjoyed excellent health for some time and his fatal illness was of short duration. His unwillingness to take to his bed was characteristic of his energy and his refusal to succumb to what he regarded as a slight ailment.

Philadelphia Truck Exhibit Shows Pneumatic Tires Favored

PHILADELPHIA, Jan. 20—The motor vehicles that regularly work for a living had their innings start last night in the Commercial Museum, Thirty-fourth street below Spruce, as exhibits of the Commercial Truck Show held by the Philadelphia Automobile Trade Association, with the co-operation of the Motor Truck Association of Philadelphia.

This show, the decorations for which are the same as for the passenger show, just concluded, will continue through the week, closing Saturday night at 10 o'clock.

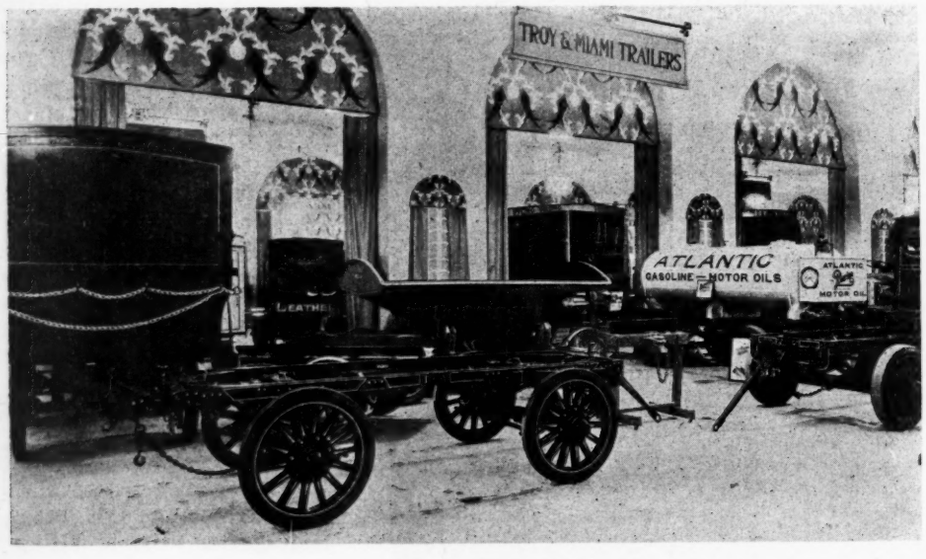
There are seventy-nine exhibits, including fifty-one of trucks, five makes of farm and garden tractors, four makes of trailers, three truck-building units, three body exhibits and thirteen accessory groups. The number of chasses now on the floor—and and there will be a number added—is 212, not counting trailers or tractors. This comprises the largest individual representation of each of these classes of vehicles ever displayed in one building at one time in Philadelphia.

The trucks include models from a half-ton up to eight and ten tons' capacity. The fields they cover include light and heavy expressing, furniture moving, delivery cars, intercity trucking, municipal work, farm use, general hauling contracting and power plant transportation. The approximate value of the exhibits is estimated at between $950,000 and $1,000,000.

Nothing in the entire show stands out with more distinctness than that pneumatic tires have come into favor—and with very few exceptions the motor trucks equipped with them did not have them on merely for show purposes. No less than 80 per cent of the exhibits had pneumatics and nearly all the trucks up to two and one-half tons bore them.

The center of a surprised group at nearly all times is the Pierce-Arrow chassis, Model R-9, five tons, already sold, equipped with the biggest pneumatic tires ever seen in this city, namely, Goodyear cords, 48 by 12. The tires and their installation made an $1,100 job alone. The chassis, with tires, sells for $6,800 in that type.

Another noticeable point in the show is the prevalence of electric self-starting devices and electric lighting systems, of especial interest as time savers for fleet owners.



One of the exhibits at the Philadelphia Truck Show

DETROIT HAS 100 EXHIBITORS

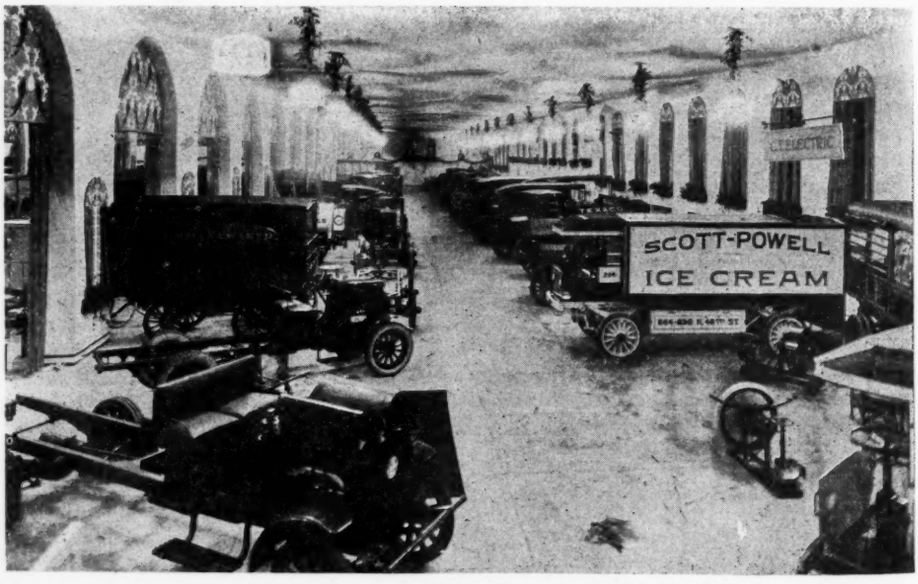
DETROIT, Jan. 26.—More than 100 different makes of passenger cars and trucks, with several models and styles of each, have been allotted space for the Detroit automobile show Feb. 14 to 21. Practically every manufacturer of accessories for the automotive industry also will be represented, prominent among which will be all-weather and special tops being displayed for the first time. The popularity of the all-season tops is increasing steadily and that feature of the show is expected to prove one of the most interesting exhibits for dealers who want to keep pace with the public's desires.

The big Ford service building, five stories of which will be used for the display furnishes an ideal location for the show and President A. L. Zechendorf, of the Detroit Automobile Dealers' Association predicts a record event from

BUFFALO PLANS FOR SHOW

Buffalo, Jan. 26—The best ideas of New York's automobile show are to be embodied in the Buffalo motor exposition, opening at the 74th Regiment armory Feb. 28. A committee representing the Buffalo Automobile Dealers' association attended the New York show for this purpose. The committee included the following Western New York dealers:

Charles F. Lindorfer, Charles J. Fletcher, E. H. Baker, William M. Coon, J. A. Cramer, Louis Engle, Jr., George B. Tyler, John J. Gibson, Ralph E. Brown, Mason B. Hatch, Edward Oliver, Charles B. Kane, Frank Kloepfer, H. B. Loveland and William Lutz, E. B. Quinlan, S. F. Swain, Charles F. Monroe, L. H. Hackett, Frederic Eaton, George Ostendorf, Edward C. Bull, Al Poppenberg, Joe Rath, L. G. Ccoepflin, A. B. Schultz, Howard B. Smith, F. E. Weir, N. A. Beardsley, A. T. McKay, P. A. Kearns and William J. Weppner.



Main aisle of the Philadelphia Truck Show

the standpoint of sales, dealer interest and exhibitors' effort. In the fact that the commercial car show will be held in conjunction with the passenger car exhibit the motor truck division is looked upon by many as the real commercial exhibit. The demand for exhibition space necessitated drawing lots with members of the dealers' association getting first chance. The dealers who are not affiliated with the association will have their space alloted next week.

G. M. C. SELLS SUBSIDIARY PLANT

St. Louis, Jan. 19—The building and equipment of the plant of the St. Louis Manufacturing Corp., a subsidiary of the General Motors Co., have been purchased by the Commercial Auto Body Co., H. F. Cartwright, President. The plant covers an acreage of approximately four acres. Both commercial and passenger car bodies will be manufactured.

The Commercial Auto Body Co. will take possession April 1, until when bodies for Chevrolet cars will be built there by the G. M. C. concern. The Commercial Auto Body Co. expects to be in its new home at Natural Bridge road and Union avenue by March 1.

The deal is said to involve $200,000. Cartwright said the present plant operated by his company at Sixteenth and Pine streets will be continued. Their production in 1919 was 4,000 light delivery and truck bodies of various types, 5,000 drivers' cabs and 6,000 truck windshields.

MINNEAPOLIS TRACTOR SHOW WILL RIVAL KANSAS CITY

Minneapolis, Jan. 20—Always a good show, the Minneapolis Industrial Exposition for this year, opening January 31, promises to exceed all previous efforts. Particularly is this true in the tractor section.

The greatest tractor market in the world is in the Northwest. That manufacturers of tractors hold this conviction in common is evidenced by the unanimity with which they have arranged for display space at the exposition. There will be almost as many exhibits of tractors and tractor accessories at Minneapolis during the first week in February as there will be at the National Tractor Show at Kansas City two weeks later.

HARTFORD DEALERS SUED AT SHOW

Hartford, Conn., Jan. 24—After a successful week's run, Hartford's thirteenth annual automobile show given by The Hartford Automobile Dealers' Association ended this evening. A canvass among the twenty-nine dealers revealed that most of them had done well at the show insofar as making sales was concerned and also gathered a sizeable list of prospects.

That the show was too early was the consensus of opinion, and while good business was done, the conservatives argue that they would have done more a month from now. Whether this is the case or not is largely a matter of conjecture. The show was a success.

About the middle of the week the recently formed independent organization known as the Automobile Trades Association of Hartford sprang a surprise by suing the Hartford Automobile Dealers' Association for $30,000. An attachment in this amount was placed upon the exhibition in a writ drawn up by Alexander W. Creedon.

The independents sued for $25,000 and all because the first page of the program carried the information that the book contained a list of all the automobile dealers in Hartford. This, of course, was a misstatement, for the program listed only the members of the dealers' association. An injunction issued by Judge William M. Maltbie of the superior court of Hartford county was served upon Charles O. Britton, president of the Hartford Automobile Dealers' Association. This document restrained the dealers' association from giving out programs with the information noted above.

As a matter of fact officers and members of the dealers' association were altogether too busy to pay any attention to the page in the program. It was torn out, however. The incident caused considerable comment and can be hardly said to have helped the new association.

F. W. Williams, Paige distributor, The Hartford Oldsmobile Co. of Hartford and the Hartford Scripps-Booth, three concerns not in the annual exhibition had shows of their own salesrooms. In all cases the results are said to have been very satisfactory.

The weather throughout the week was miserable. Snows were frequent and the temperature was away down. At present there is over a foot of snow on the ground which has not helped the dealers by any means. This condition strengthens the argument of the late show faction that the present exhibition is too early.

MAIL TRUCKS SHOW PROFIT

Washington, Jan. 27—That motor trucks carrying food products for the Post Office Department are profitable was indicated in a congressional debate held recently, when the appropriations for motor trucks and air mail service were both eliminated from the Post Office appropriation bill by the House of Representatives. It was shown by Congressman Kelly of Pennsylvania that five motor trucks operated from July 1 to Dec. 30, 1919, a period of three months, at a cost of $14,588.14, including all expenses, and during the same period the postal receipts were $52,067.41, making a profit of $37,479.27.

That the use of motor trucks to haul the potatoes needed in the city of Washington would save over $1,000,000 in one year to the consumers, was pointed out by Mr. Kelly, who also stated that similar savings could be effected on eggs, butter and other farm products. For example, he stated this city requires 6,800,000 dozens of eggs a year, which could be brought by motor truck for two cents per dozen as compared with 19 cents per dozen under existing conditions, a saving of $1,140,000 in 12 months under the motor truck plan.

Service Problem Feature of Cleveland Automobile Show

CLEVELAND, Jan. 24—That service is the keystone on which the success of the automobile industry must rest clearly was demonstrated in the Cleveland show which ended a successful week here to-night. Close to 100,000 persons visited the show and Secretary Fred Calvey voiced the opinion of exhibitors when he declared it had been Cleveland's greatest exhibition, not only from the standpoint of public interest and sales but from the efforts to instill in the minds of owners and prospects the importance of proper maintenance from the service man's viewpoint.

Never before have the dealers given so much thought and so much time to the service problems. In nearly every exhibit the service manager or one of his expert mechanics was on hand to take the visitor from tire to wind-shield in a detailed explanation of each part and its functions. Necessity for constant vigilance, as the price of real enjoyment from the car was stressed and frequent inspections and overhauling by a competent service man was urged. The interest attested by show patrons in the operation of various units as explained by the service man, demonstrated their eagerness to know all about the inner workings of the car and how best to keep them in 100 per cent efficient condition.

Leaving the car display the visitor saw on all sides attractive booths for the display of accessories, designed to add to comfort or convenience or the life of the car and the various parts. Interest was apparent and particularly in the case of two displays of windshield cleaners, one automatic and moving back and forth constantly, the other operated by hand and fitted with a chemically-treated felt that prevented the accumulation of mist, water or snow, to blind the driver. Snow sticking to the glass and frost preventing clear vision and making driving dangerous, made drivers enthusiastic as they left their cars and picked their way through the snow-storm to the show building to find on display the attachment designed to eliminate much of the danger and worry.

Milwaukee Show Closes With Every One Satisfied

MILWAUKEE, Jan. 24—Two lasting impressions derived from Milwaukee's twelfth annual show, held Jan. 19 to 25, in the Auditorium, are that as a spectacle it reaches far beyond anything ever attempted outside of Chicago or New York, and that with its aggregate of more than 125,000 sq. ft. of exhibit space, it is in point of magnitude comparable to the metropolitan or national shows, although in general its scope of influence is presumed to extent throughout Wisconsin, the upper peninsula of Michigan, and territory contiguous to these boundaries.

Like past Milwaukee shows, this year's spectacular exposition was primarily a retail merchandising affair. There always has been a strong element of appeal to the dealer, for the exposition is staged by an organization, the Milwaukee Automobile Dealers, Inc., which is composed principally of distributors. These distributors, in the main, are retail dealers in the home county, Milwaukee, out of which originally grew the local show idea as a proposition to interest the consumer in Milwaukee and immediate vicinity.

Demand Greater Than Production

In recognition of the fact that the automotive industries are entering the great merchandising period of their existence, the Milwaukee show of 1920 may be said to reach further as a dealer show than in any past year, which element is perhaps more conspicuous than the purely retail element of appeal to the Milwaukee consumer. There are two main reasons for this:

1. In view of the acute shortage of passenger cars during 1919, and the probabilities that production will not catch up with demands at least before the beginning of 1921, it is deemed not so necessary to make appeal to the consumer in such great measure as in years when there were plenty of cars in comparison with the number of buyers.

2. This being the beginning of the great merchandising era of the automotive business, the distributors, with the co-operation of the manufacturers, have a very particular reason to make appeal to the dealer trade in order to build up a substantial, efficient and thorough-going merchandising organization.

Interesting the Consumer

In explanation of Reason No. 1 it may be said that Milwaukee distributors understand very well that no effort should be overlooked which will interest the consumer, who for a year or two has been "fed up" on car shortage to the point, where it might become dangerous to the future of the business, despite the fact that the present demand is at peak and the well-filled purse gives promise of a rising curve for some months to come.

The strong educational movement to bring about economy which is resulting from the widespread "Fair Price" agitation doubtless is going to have an appreciable effect upon the consumer, sooner or later. Extravagence will have an end when the public gets down to real thinking after its orgy of thriftlessness growing out of the war.

The great strides which the automotive industries are making, the unparalleled expansion which it is undergoing, must eventually produce an output of passenger cars that will require the utmost effort of systematic endeavor to induce the proper absorption by a public that is beginning to learn economy.

This has a very important bearing on Reason No. 2. In addition it is recognized that dealer organizations, virtually shot to pieces by the war and its effects, have not been brought to the highest stage of perfection from the viewpoint of manufacturer and distributor. From the end of the war in November, 1918, to this day, the scramble for merchandise has been too great to allow time and thought to the systematic upbuilding of a permanent, lasting organization, through which passenger cars are placed in the hands of the consumer. That is a work which the Milwaukee show of 1920 is designed to advance.

The construction of a new and vigorous distributing organization on the part of the manufacturer has been under way all of 1919, and the industry has come to the point where the same reconstruction must be brought about among the retail distributing forces.

Best Dealers Survive

Comparing the names of exhibitors with the names of cars displayed at this year's show, and drawing a parallel with the 1919 show, for instance, reveals a complexion of the distributing organization in Milwaukee which is so far different that it awakes attention. The changes affect both the names of concerns which distribute certain lines, and the names of the men at the head of concerns. It is of course true that some of the old standbys are still distributing cars whose names likewise are standbys, but the transition indicates that the natural law of "the survival of the fittest" has worked with much greater effect than since the passenger car industry was founded.

The changes in the dealer field of Wisconsin and the Peninsula during the year have been much more marked, due to the fact that the distributors at Milwaukee have cast about for dealers who will not only properly represent their cars, but are equipped in all ways to provide a lasting and permanent representation. The show provides the opportunity to cast up accounts and determine whether this or that dealer is fulfilling his promises and is entitled to a renewal of his contract. Many dealers have been on probation for the last three, six or nine months and they have been called to or voluntarily come to the show to make their accounting to their distributors.

Display of Every Nature

The 1920 Milwaukee show is a wonderful show. The great Auditorium is, so to speak, jammed with displays of every nature. In reality, the layout is so well planned that there is no suggestion of jamming, as the word is popularly understood, but nearly every foot of available floorspace was required to accommodate all exhibits this time.

The most notable feature indicating the enormous demands upon space is the addition of a mezzanine floor in the main arena of the Auditorium, the largest of six big halls embraced by this great $1,500,000 exposition building. The mezzanine floor is a temporary structure built over the permanent seating of the balcony and gallery tiers of the main arena and gives it somewhat the layout of the Coliseum at Chicago.

The special floor is built on a framework of structural steel, running around the parabolic arena, a distance of 500 feet. It is 30 ft. wide. The framework required 80 tons of structural steel, fabricated in such manner that it may be put up in 24 hours and dismantled in 12 hours. It is 12 ft. above the arena floor level and floored with 2-in. planking. From the front line of the exhibit space to the railing overlooking the main floor a promenade of eight feet is provided for the passage of visitors. The mezzanine floor is devoted exclusively to passenger car exhibits, as is the main arena floor. It is approached by a grand staircase in the center of the hall, with auxiliary stairs at both ends, which flank the mammoth stage.

Machinery hall, which occupies the basement of the Auditorium, and in floor space is larger than the arena itself, is devoted, as last year, to the motor truck displays and exhibits of truck equipment, trailers, etc.

Great Demand for Space

Kilbourn and Juneau halls, each capable of seating 800 to 900 persons when equipped with seats, are used to accommodate the overflow of passenger car exhibits, being filled in with automotive equipment displays. These halls are on the ground floor, just off the arena and connected with it by a grand foyer. This, with the corridors running about the exterior of the arena, which ordinarily are used for wardrobe and similar purposes, contains the main equipment and accessory displays.

The demand for space for showing automotive equipment was so great this year that for the first time in the his-

tory of the Milwaukee show, it was necessary to use a second floor hall, namely Engelman hall, which is filled to capacity. The only other hall on the second floor is Plankinton hall, which is a concert hall and equipped with a permanent seating arrangement, therefore not being available for exposition purposes.

It is estimated that the Milwaukee Dealers, Inc., had invested nearly $70,000 in special equipment, labor, etc., before the doors of the 1920 show opened Monday evening, Jan. 19, at 7:30 o'clock. This includes the cost of the mezzanine floor, which is a permanent investment since the structure may be installed and dismantled at will and stored away.

Decorations Striking

The main arena and mezzanine floor are done in Italian marble effect, to give the impression of a massive Venetian courtyard. The colorings are in pale tones of sea green, browns, grays and high lighted with pale gold trimmings. The scheme was wonderfully effective in contrast with the unusual color schemes of the show cars, which never were so varied and striking as this year.

The Milwaukee show is one of the few held in the large centers in which the motor truck and the passenger car is exhibited at the same time. Only in one year were two separate shows staged, but the motor truck exposition did not come up to expectations in the matter of patronage. For the past four years the two have been combined.

The motor truck division of the show has depended largely upon the appeal and attraction of the passenger car and equipment show for its patronage. By itself, the single experience indicated, it would hardly justify itself as an exposition affair. A fair degree of success has generally been reported by exhibitors of trucks when they joined with passenger car dealers in a joint show. No particular complaint has been made at any time, but the management has recognized the necessity of stressing the motor truck division in an unusual way.

Truck Tour Meets Difficulties

This year a mid-winter motor truck demonstration tour was arranged for the especial benefit of the truck department of the show. The unfortunate circumstance of a blizzard sweeping southern Wisconsin on the night before the tour began caused a tangle enroute which tied up the seventeen participating trucks before the end of the first day. The high wind drifted the heavy snow into an almost invulnerable blockade.

The tour was to cover three days and a route of about 175 miles. The first day was to be from Milwaukee to Sheboygan; the second, from Sheboygan to Fond du Lac, and the third, from Fond du Lac to Milwaukee. With a number of officials' cars and relief trucks, the seventeen contestants started from Milwaukee on Friday morning, Jan. 16. A few got as far as Cedar Grove, but none could penetrate the barrier of great drifts and get to Sheboygan. By Saturday night most of the trucks got through, but several were tied up at Cedar Grove until mid-week.

Nevertheless, the outcome of the expedition is not regarded as a complete failure. It had been intended to place the competing trucks on the floor of the truck division at the Auditorium on their return. Instead, the dealers had to take other trucks out of stock to make their displays complete.

The atitude of truck owners and prospective owners who visited the truck division and spoke with dealers was not unfavorable to the cause, as might be imagined from the lack of success of the expedition. Truck owners realized better than others what the big blizzard meant to truck operation, and for that matter, any form of freight transportation facilities. The prospective owners appeared to understand how it happened and there was not the least suggestion of derision.

Montreal Show Opens For Its Run of Week

MONTREAL, Jan. 20 — Montreal's seventh annual motor show under the auspices of the Montreal Automobile Trade Association at the Motordrome was officially opened today by Mayor Martin and will run for a week. The concensus among both dealers and visitors at the opening night was that the present exhibition outdoes all of its predecessors and is truly indicative of the part the motor has played, is playing and its destination. There was in evidence a distinct reaction from the partial stagnation to which the automobile was subjected during the years of the war. Every available foot of space some 75,000 square feet was occupied by exhibits on all three floors of the spacious Motordrome, a new building and location, which has proved to be a building admirable suited to the purposes of such an exhibtion.

Not Enough Space For All

Despite the space which was available some sixty applicants mostly accessory dealers had to be refused and it was impossible to find space for some of the eleventh hour arrival of cars which for the time being had to stand in the entrance halls. About one hundred exhibits in all were on view. The building is pleasingly decorated for the occasion and individual exhibitors have shown no little originality in the decoration of their own concessions. Music is furnished by the Royal Orchestra of Montreal.

One feature of the passenger car and motor truck exhibits was the number of foreign makes shown their first appearance since the war, likewise a large number of English or British accessories were exhibited in Canada for the first time.

Montreal, according to latest reliable information, has practically 16,000 cars or one for every fifty of the population of the city. Over 2,000 motor trucks are listed in Montreal.

The question has often been asked why Montreal which is the centre of so many of the Dominion's more important industrial activities has not been developed as a centre of the automobile manufacturing industry. This is a matter which has received considerable attention from Montreal and Quebec Province enthusiasts. Inquiries made in well informed circles as to the possibilities in this direction tend to show that the issue is a live one. At least one great manufacturing concern with a huge plant situated in Montreal and with almost unlimited resources is said to be seriously considering entering this field in the near future. The concensus of opinion is that one or two pioneers of such standing would not only meet with success for themselves but would place Montreal on the map as the Detroit of Canada, the second largest user of automobiles in the world.

Montreal Favorably Located

It is admitted that there are difficult obstacles, but the feeling that these can be overcome and more than balanced by the natural advantages of Montreal as an automobile manufacturing city. One party in particular who was interviewed on the subject a man who through the clarity of his business vision has achieved a success in his own end of the automobile industry which has placed him in the position of an authority on the question is especially optimistic regarding the outlook for Montreal as a future manufacturing centre. This man has studied the question from all angles and the outbreak of the war frustrated plans which had been worked out in detail for the manufacture of a Canadian machine in Montreal. He frankly and fearlessly faces the difficulties which will be encountered by the pioneers in the industry, and against them presents advantages which he is confident would overcome the obstacles and eventually make Montreal a successful motor car manufacturing center. One of the main advantages is the favorable location of the city with regard to railway terminals. Its accessibility to ocean steamships would offer a distinct advantage to the export trade which would be a large item with the markets of Great Britain and other colonies open to the Candian-made product under preferential trade arrangements. It was pointed out that Montreal is also readily accessible to the sources of the necessary raw material. Another favorable feature lies in the fact that the Province of Quebec enjoys very favorable labor conditions.

Three Monroe Cars Entered for Indianapolis Contest

INDIANAPOLIS, IND., Jan. 27—That Indianapolis is again to be a challenger for world speed supremacy was announced with the entry by William Small Co., automobile manufacturers of the Hoosier capital, of three Monroe cars in the eighth annual International 500-mile sweetstakes on the Indianapolis Motor Speedway, Monday, May 31.

Time was when no Indianapolis race was complete without its galaxy of defenders of the native heath, and the victories of the Marmon Wasp in 1911 and old National No. 8 in 1912 attest to the skill and daring of the Hoosier scions of the racing arena. Following Marmon and National came Stutz and Premier in attempts to capture the world's greatest speed contest, an era of foreign victories being inaugurated with the retirement of National from racing in 1912, although the homebreds fought valiantly in every engagement and were not counted out until the last lap was run.

The last appearance of an Indianapolis team was in the 300-mile race of 1916, when Premier took a final fling at first honors but was forced to yield before the onslaught of the overseas invaders. Now comes the Monroe aggregation again to carry the gonfalon of the Hoosier capital into the fray, with the hopes of every member of her racing populace solidly united behind it.

The Monroe team is led by Louis Chevrolet, veteran driver and master designer of racing cars, under whose supervision the new Hoosier speed creations are rapidly being pushed to completion. Chevrolet is known to the racing world as one of the most brilliant inventive geniuses in the history of the sport, and his latest efforts will be observed with extraordinary interest both by the racing fraternity and more exclusive society of engineering experts.

To Indianapolis the signing of Chevrolet to head the repulse of the European onslaught carries brightest hope for success that has gladdened the hearts of her citizens since Harry Stutz retired from racing, with a string of international records, won at Sheepshead Bay, dangling from his belt.

WARNS AGAINST SEIZURE LAW

Chicago, Jan. 26—Automobile dealers will be gambling one billion dollars in 1920 against the possibility of automobiles sold on conditional bills of sale and on mortgages, being confiscated by the Federal government because the persons to whom they were sold carried "moonshine" liquor in them, according to C. A. Vane of St. Louis, general counsel of the National Automobile Dealers' Association, which is in session at La Salle hotel today. The dealer association represents the interests of 30,000 automobile dealers of the country.

Vane's statement was the result of recent decisions in two United States Circuit Courts of Appeal wherein it was held that if an automobile is seized for carrying liquor upon which the Federal revenue has not been paid, the car is subject to confiscation even though it has been only partly paid for and likewise the innocent owner will not be allowed to set up his claim for possession of the car because it remained unpaid for.

Vane estimated that 2,500,000 automobiles would be sold in 1920. The prewar unit of sale was $736. Probably 75 per cent of the automobile retail business, he declared, is done on time payment. Of this amount probably 25 per cent is paid as an initial installment to obtain possession of the car.

"A man may drive out of your establishment with an automobile upon which he has made the first payment only, and an hour later the vehicle may be confiscated and your interest taken too, if he is arrested for having in his possession liquor upon which the tax has not been paid."

Vane pointed out that the dealers would have to go to Congress and ask for an amendment to the revenue laws similar to that in the Volstead national prohibition bill, so that a mortgagee without knowledge of the wrongful use of his vehicle could reclaim it. Under the Volstead law a car may be confiscated also for transporting any kind of liquor, but if it is liquor upon which the tax has already been paid, and the car is used without the dealer's knowledge or consent, the dealer may reclaim the car.

WOULD RESTRICT TRUCKS TO CITIES

Boston, Jan. 27—According to Secretary Dwight W. Sleeper, of the Motor Truck Club of Massachusetts, there has been introduced into the Massachusetts legislature the most inimical measure ever devised to eliminate motor truck competition. It provides for making inter-urban street railways common carriers, and as such giving them the right to refuse permission to freight-carrying commercial vehicles to cross their tracks. As these roads run all over Massachusetts it would mean restricting commercial vehicles not only to cities, but to certain streets in cities as well. And to aid in this attempt to stop motor trucking the stock and bondholders have been asked to subscribe to a fund for propaganda work. The motor truck owners of the state are being informed of this measure, and it will be given a thorough airing before the legislature starts hearings upon it.

Meanwhile the steam railroad officials are going about now attending meetings of local boards of trade in the different towns at which they seek to get in close touch with shippers, and promise to do all sorts of things to get back the freight shipments now going forward on motor trucks.

Many European Cars Being Built for Indianapolis Race

PARIS, Jan. 1—From 10 to 15 European 183 cu. in. racing cars may be expected to start in the next Indianapolis 500 mile race. No official entries have been received and manufacturers are maintaining secrecy regarding their plans, but it is known that cars are in a very advanced condition at the Fiat, Peugeot, and Ballot factories. Each of these firms may be expected to send a complete team of three cars. In addition to this two French firms who do not wish their names to be made public at this time have 183 cu. in. cars in hand. The F. A. S. T. Co. of Turin, Italy, is endeavoring to get ready in time, and Bugatti holds out hope of two or three cars. cars will certainly materialize. If all the One Belgian firm is also building and hopes to be ready in time. Ten of these cars should carry through successfully, it would give a total of 20 European racing cars, thus constituting a record.

Sunbeam has decided not to race at Indianapolis. The English company, however, is now preparing a special 400 hp. racing machine which will make its first appearance at Brooklands during the Easter meeting, when it will go after several old records, and will later be run on the beach at Fanoe Island, Denmark, with the object of bettering the times set up by De Palma on the Packard. This Sunbeam car carries a special aviation engine.

As last year, Ballot is building 8-cylinder cars for Indianapolis. They will naturally be smaller than those seen on the track in 1919, for their cylindrical capacity has been kept down to fit the rules. These cars have been designed by Engineer Henry, who before the war was responsible for all the Peugeot racing productions. There is every likelihood that one of the Ballot cars will be given to Ralph DePalma. The other drivers have not been selected, but Thomas doubtless will be a member of the team.

Peugeot has secured the services of Andre Boillot and Jules Goux, but there seems to be a doubt whether the latter will come to America. Goux has started in business as Peugeot dealer with showrooms in the Champs-Elysees, Paris; and according to reports he intends to marry and quit the racing game. There are numerous candidates for the vacant positions on the Peugeot team.

Fiat already has secured the services of Louis Wagner on its racing team. The second man will be Minoia, and the third choice seems to lie between Moriondo and Bordino, both of them Italians and experienced race drivers.

There will be no 183 cu. in. race in France this year, for the majority of the manufacturers have signed against racing. It has been decided, however, that a big race will be held in 1921, and already the Lyons district has put in a claim for the race to be held on the old 1914 Grand Prix course. This course will be adopted unless Strasburg asks for the race, in which case the Lyons club will withdraw in order to allow the race to be held in the reconquered provinces.

Italy will stage a race for 183 cu. in. cars, in the neighborhood of Brescia, for the month of September. This will be a road race over a very fast course, and looks likely to unite all the leading Italian firms and not a few from France.

SET NIAGARA FALLS SHOW DATES

Niagara Falls, N. Y., Jan. 26—Niagara Falls will hold its first automobile show during the week of Feb. 23, just preceding the Buffalo automobile show, which opens on Feb. 28. Permanent organization has been affected by the Niagara Falls Auto Trades association, which will be sponsor of the show.

Elgin Road Race to be Held; Drivers Promise Support

CHICAGO, Jan. 28—Definite announcement has been made that the Elgin road race will be held in 1920 in the fall, according to Harry P. Branstetter, who is slated to step into the presidential shoes of the Chicago Automobile Club when the annual meeting is held this month. Mr. Branstetter will succeed Pres. Callender, according to present plans, and the desires of those who have been working with the Kissel dealer.

At an informal meeting between Pres. Callender, Charles P. Root, chairman of the contest committee, and Mr. Branstetter, who was general executive for the Elgin Road Race last year, and after consultation with the Elgin Road Race Association, it was deemed none too early to make the formal announcement of the 1920 Elgin classic.

Drivers Promise Support

The fact is that Mr. Branstetter while at the New York automobile show, took pains to interview both drivers and makers of racing cars and learned of their desire to see the Elgin staged again and of their promise to support it to the limit. Accordingly, the race will be run on the old Elgin course, some time the latter part of August or the first part of September. The exact date will depend upon the coming of the Glidden tour, which is tentatively scheduled to start from New York and follow the Lincoln highway to San Francisco the entire distance of some 3,400 miles.

It is Mr. Branstetter's desire to arrange with Chairman Kennerdell, of the American Automobile Association contest committee, to have the Glidden caravan reach Aurora on the Lincoln highway and lay over one day so the drivers, observers, officials and others can be guests at the Elgin road race. If the Glidden tour follows the Lincoln highway it will be necessary to make Aurora the lay-over point, as the cars will not be permitted to leave the course as laid out, unless the Glidden tour officials change the route slightly to permit Elgin being the night checking station.

Charles P. Root, who last year was chairman of the contest committee of the Chicago Automobile Club and thus directed the 1919 Elgin race, has been selected to manage the Glidden tour on its pilgrimage to the Pacific coast; likewise, F. E. Edwards, also of Chicago, and who has always served as chairman of the technical committee of the Elgin, has been named as head of the Glidden tour technical committee.

Prizes Not Yet Determined

Mr. Branstetter was not in a position to say how much would be put up in prizes, but he did declare that the race would be bigger and better than ever, which may be taken to mean that there is a possibility of there being two days —one for cars of 300 cu. in. piston displacement and the other for the new size racing cars, 183 cu. in.

"We cannot, of course, come to anything really definite regarding the details of the race, but this I can say, that it will be bigger, better and more attractive to both the entrants, the drivers and the public than at any time since the vent was first staged in the fall of 1910," said Mr. Branstetter, "Naturally we hope Chairman Kennerdell will be able to arrange the starting date for the Glidden, so as to permit the officials, drivers, observers, and passengers to take in the Elgin road race, as well as to let the people see what an imposing spectacle such a thing as the Glidden tour cars make."

Ford Street Car to be Given Test in Race with Fast Train

DETROIT, Jan. 26—The body for Henry Ford's gasoline street car which was shipped to the tractor plant at Dearborn several days ago has been fitted with the internal combustion engine and plans for the acid test in a race with a fast passenger train are being completed. The car body is 37 ft. over all and will seat 42 passengers. The test car which will be sent over the rails ahead of the fast Wolverine on the Michigan Central railroad will be a much heavier type than the proposed Ford street car, in order to conform to railroad transportation laws and conditions that will be confronted. It will be a double truck car, the weight of each truck with its four wheels exceeding 2000 pounds. The body was built by the G. C. Kuhlman Car Co. of Cleveland.

The power plant will weigh about 1500 pounds and the new street car will weigh in its entirety about seven tons, in contrast with the 12 and 14-ton street cars now in use. The Ford car will develop 90 hp. and will be able to make 70 m.p.h., although it is so constructed as to permit of its being geared to conform to city and state regulations. It is equipped with air and foot brakes and will take a three per cent grade at a speed of 20 m.p.h.

Cheaper Than Steam Engine

The wastefulness of coal as fuel, according to General Manager Charles E. Sorenson, is only one of many reasons why the internal combustion engine and the individual power unit soon is destined to supersede present methods on steam as well as street railroads. He predicts its general adoption in the near future in view of the fact that it makes possible the use of lighter rails and does away with all the expensive paraphernalia of overhead transmission, transformers and costly power stations. Dangers of breaking electric wires are eliminated and there is no possibility of complete tie-up, as is the case when an overhead wire breaks, he says.

Sorenson has figured out that on the basis of five miles to a gallon of gasoline he could make the New York to San Francisco run without a stop for fuel. Neither Mr. Ford nor Mr. Sorenson will contend that the engine is perfect or that it will be available immediately for commercial purposes. They admit it may have to be torn to pieces and rebuilt but both are confident of the correctness of their theory and insist that the individual power unit and the liquid fuel engine is destined to take precedence over steam.

DesMoines Dealers Meet

Big Attendance Features Annual Meeting of Iowa Motor Men

Discussion of Coming Show Chief Topic of Conversation

DES MOINES, Iowa, Jan. 27—The annual meeting of the Motor Trades Bureau of the Des Moines Chamber of Commerce this year brought out the largest attendance in the history of the bureau. In addition to the large number of local motor tradesmen present there were a number of dealers from Council Bluffs, Waterloo and Omaha.

Discussion of the plans for the Des Moines Motor show occupied a major portion of the evening program. James Bowie, who succeeded Don Chamberlain as assistant secretary of the bureau, was among the speakers.

At the annual election which proceeded the dinner the following directors were named car dealers: C. O. Hart, Dean Schooler, George W. Jones, D. S. Arudineir, R. J. Clemens; garagemen: J. C. Bernhard, C. F. Claibourne; truck dealers: Harter B. Hull and William Gibson; accessory dealers: N. W. Levegrove, Ralph Starr; wholesale and branch tire dealers: G. A. Spohr and H. C. Carr; retail tire dealers: W. B. Jeffrey; gasoline and oil, J. H. Cushman; electrical and service stations; F. G. Teufel; used car dealers: L. J. Davey, East Des Moines; W. T. Wilson, Tom Messenger; taxicabs, A. R. Reel; aircraft, C. M. Young.

At the first meeting of the new directory board following the election, N. W. Lovegrove of the Herring Motor Co. was named chairman and C. F. Claibourne, vice-chairman.

DECATUR DEALERS ORGANIZE

Decatur, Ill., Jan. 28—The Automobile, Truck, Tractor and Accessory Dealers of Decatur have completed an organization and elected the following officers: President, B. B. Burns; vice-president, A. H. Drysdale; secretary-treasurer, R. M. Tenney.

It was voted to affiliate with the state and national associations. The association starts out with thirty members and will meet twice a month. The question of a winter show will be taken up later. For a number of years efforts to organize the dealers of Decatur have been made, but always without success until the present time. It remained for F. P. Drury, a traveling representative of the national association, to "put it over."

A credit rating system will be adopted at an early date. It has been found that there are numerous instances where motor vehicle owners will run up a large bill at a garage and, when pressed for payment, will transfer their patronage elsewhere. Members of the association will be advised of this class and credit will be refused to those guilty of the practice. It was also voted to abandon the practice of giving dealers' discounts to mechanics who performed repair work upon their own time and who obtained new parts to replace those broken or worn. It was thought best to grant discounts on parts only to members of the association in good standing. Many other reforms, calculated to promote the welfare of the members, will be taken up. There is much enthusiasm over the new organization and it promises to be one of the most successful of the kind in central Illinois.

GENERAL MOTORS EARNINGS HIGH

New York, Jan. 23—According to information from a reliable authority, General Motors Corp. earnings (before taxes) for the first ten months of 1919 amounted to $84,000,000. Total earnings for the year (before taxes) are estimated at $96,000,000. This compares with earnings (before taxes) for 1918 of $45,541,726. Earnings for the calendar year 1920 are estimated at $145,000,000.

Gross assets employed in the business of the company at the present time are $500,000,000. Gross sales for 1919 as estimated will show a total of $700,000,000. This compares with $326,044,755 for 1918. Gross sales for 1920 are estimated at $1,000,000,000. The estimated gross sales of $700,000,000 for 1919 are equal to the average gross annual sales of the United States Steel Corp., for the five years previous to 1916.

DISTRIBUTOR HOLDS OWN SROW

Bloomington, Ill., Jan. 27—The Dayton Keith Motor Car Co., Bloomington, distributor of Ford cars and Fordson tractors, arranged a unique exhibit of implements and tools designed to operate with tractors. This display was given at the spacious Coliseum in Bloomington Jan. 21 to 24 inclusive. Twenty manufacturers of plows, disks, harrows, ditchers, manure spreaders, hay balers, cultivators, belting, oil, silos, etc., arranged an exhibit of their products and the show was the first of the kind ever arranged by a tractor distributor in Illinois. Moving pictures were shown, illustrating a farm and its operations before the advent of the tractor and other time and labor saving machinery, and also the methods following the adoption of tractors. A. E. Hiltebrant, manager of the national tractor shows, whose home is in Bloomington, was engaged as general manager of the Dayton Keith show and gave several talks upon power farming. There were also addresses by men prominent in the implement manufacturing industry. No admission was charged to the show and it attracted several thousand farmers. An orchestra was engaged during the entire period of the exhibition and considerable attention was paid to the decorations.

To Hold Lighting Show

Nearly Every Manufacturer of Farm Lighting Plants Will Be Represented

One of the Features to Be Tower of Jewels. 500,000 Lights Will Burn

BLOOMINGTON, Ill., Jan. 27—Believed to be the first show of farm lighting systems in Illinois, will be staged at the Coliseum in Bloomington on Feb. 11 to 14 inclusive. Nearly every manufacturer of these plants in the country will be represented by an exhibit and it will be under the auspices of the McLean County Electrical Development Co. Electrical contractors of central Illinois agreed to co-operate and will put on a display. Thirty-seven exhibits have been booked and 500,000 lights will burn. One of the features will be the Tower of Jewels which was shown last year at the Chicago electrical show and which will be brought to Bloomington. There will be a number of other novel electrical exhibits.

DUNLOP ENLARGES PLANS

Buffalo, Jan. 28—Information which reached Buffalo this week indicated that the plant of Dunlop America, Inc., shortly to be built at Buffalo, will be larger than was at first supposed here. Instead of an investment of $10,000,000, as was originally announced, the tire plant of the British interests will represent an investment of close to $25,000,000, it is believed. Surveying of the site of the new factory, adjoining the Niagara river near the Buffalo city line, is now under way.

A building for the manufacture of cotton cord fabric is to be included in the plant, it is announced.

JITNEY MUDDLE REACHING CRISIS

Boston, Jan. 27—A crisis has been reached in the fight between the public trustees operating the street railways of eastern Massachusetts in their efforts to kill off jitney competition by the demand made today upon Gov. Coolidge by Mayor Sullivan of Salem that he instantly remove the men in charge of the railways as being incompetent. This resulted from the street railways stopping car service in Salem in the middle of a below zero cold snap. A wail went up from the people, and the jitney men got busy to try to fill the gap. It seems Salem stopped the jitneys once, then the jitney men got 4000 voters to sign a petition for a referendum vote on the question Jan. 27. That allowed them to operate. But the street railway people decided not to wait, so their ultimatum, no jitneys or no street cars being passed up, they hauled off the cars.

Mayor Sullivan immediately wrote Gov. Coolidge, calling attention to the fact that while the governor was elected on a law and order platform, the street railway officials that he appointed were not obeying the law by depriving the people of Salem of service, and so they should be dismissed. The governor called a conference at the State House with all but the jitney men, as a result of which he declared that the jitneys should not operate, and the car service was to be resumed. But there is to be an election Jan. 27 and if the jitney men win there will be more trouble.

Meanwhile the jitney question is going to the Supreme Court through a Weymouth club, which runs a jitney for its members, refusing to stop, as it charges no fares, but figures that the club dues cover among other things the expense of operating the jitney, which carries no other passengers. It is an interesting muddle.

EXCHANGE HURTS MOTOR DEALERS

Toronto, Ont., Jan. 24—The effect of the soaring American exchange rate, through the depreciation of the foreign value of the Canadian dollar, is being largely felt by automobile dealers.

"These financial conditions will bring the all-Canadian-built automobile into greater prominence than ever," said one manufacturer, "and this is the prominence that it should hold in the mind of the Canadian motor car buyer, because with adverse trade conditions it is up to Canadians to book everything that is made in Canada to beat down the adverse trade balance against us, or we will go to the wall."

It was pointed out that the buyer of an American-built car has to pay 42½ per cent duty in addition to which there is the war tax when the car passes the custom house. This adds half as much again to the price that the buyer has to pay for his car.

But when he comes to make out his check, with the high rate of exchange, he finds he has to add almost 10 per cent to it, because the American manufacturer has to be paid in American money, which is at a premium.

In the Canadian motor factories some of the unfinished material is imported from the United States, but because it comes in the unfinished condition, the duty on it is only 20 per cent.

"YELLOWS" INVADE ATLANTA

Atlanta, Ga., Jan. 27—The Yellow Taxi Co. which had its inception in Chicago some years ago and now operates in many of the larger cities throughout the United States, has opened a service in Atlanta and its cabs will be seen on the streets here for the first time this week. The local station is located at 37-39 Ivy street, with A. R. Redburn as general superintendent. Bonded chauffeurs and strict adherence to meter rates is the principal policy of this company.

Steel Consumption Large

Motor Cars Using More Tonnage at Present Than Railroads

Output of Cars is Limited Only By the Ability to Get Sheet Steel for Bodies

PHILADELPHIA, Jan. 25—Samuel D. Barker, financial expert for The North American, says in a recent issue of that paper:

"Automobile and motor truck construction is now taking a tonnage of steel in volume greater than heretofore has been called for by any single group of consumers other than the railroads. Just at present it is much larger than what even the railroads are currently taking. It is stated by one of the chief automobile companies, that the output of cars now is limited only by ability to get sheet steel in quantities sufficient for body construction.

"The vast program of road construction and improvement to which the states and nation are committed and for which undertakings a great aggregate fund has been made available, is regarded as establishing a new basis for the automobile industry of the country. It is confidently predicted that the new roadways suitable for automobile traffic on an economic basis will call into service thousands of motor trucks where there are now hundreds and make new demand for automobiles, both for pleasure and for business use. The substantial roads will open the way to employment of motor trucks in all kinds of service and enable transportation of a great traffic which, heretofore, has had to go to the railroads.

"At the same time it is pointed out that the road construction now going forward throughout the country is throwing upon the railroads a big special traffic in the heavy materials such as stone, gravel, cement and equipment used in road building. This is a fact which railroad managers are taking into calculation in their programs for the current year."

ONE AUTOMOBILE A DAY STOLEN IN NEW ORLEANS

New Orleans, La., Jan. 24—Thefts of automobiles in New Orleans from Jan. 1, 1918, up to Dec. 1, 1919—23 months—total 498, involving property valuation of more than $500,000, an average of almost one for every working day of the period.

The police department, however, has earned great praise from the motorists by recovering 275 of the stolen cars, considerably more than half. Valuation of these recovered cars was placed at $350,000 by their owners. Automobiles stolen and not recovered, 223 in number, represent a loss of approximately $200,000. Since Jan. 1, 1918, approximately 5,000 cars have been stolen in various parts of the United States.

Classification of the cars stolen show that the thieves prefer Fords, though this may be because of the greater number of these cars in use, and also because it is easier to make away with a Ford and change its number than it is to escape with other cars which have more secure locking devices. It is also easier to change bodies on Fords, putting a taxi body on the running gear of a stolen car and the body on the chassis of the taxi, with Fords, than with other makes. Since the first of January, 1918, of the 498 cars stolen, 273 were Fords, of which 110 were recovered by the police. Next in number comes the Hudson, of which twenty-nine were taken and seventeen covered. Third on the list is the Buick, of which auto thieves got eighteen, but fourteen were recovered.

Supt. of Police Mooney has recommended to the Motor League of Louisiana that it work for the enactment of a law making the stealing of an automobile a felony, with a minimum sentence of three, and a maximum of five years at hard labor in the penitentiary as a penalty on conviction. Delays by auto owners in reporting thefts are blamed by the police chief for failure of his men to recover many stolen cars.

WILLYS INVADES ENGLAND

Detroit, Jan. 27—Formation of the Willys-Overland-Crossley Co., to build 25,000 Overland automobiles in England every year has been completed, facts in connection with the deal having been made public by Edwin B. Jackson, vice-president of Willys-Overland, who recently returned from Europe. The first European expansion plans of the Overland were worked out during Jackson's visit to England, whereby a financial and working alliance has been made with the Crossley Motor Works, Ltd., for the production of Overlands by American processes and British labor.

American foremen will be used for the time being in the English factory, as will also American parts. The new company will have a capital of 2,000,000 pounds sterling, approximately $10,000,000. Jackson said labor conditions in Britain were being shaped up rapidly and therein he sees opportunity for great aid in immediate production on a large scale.

PEUGEOT AND RENAULT IN COMBINE

New York, Jan. 27—Peugeot and Renault interests have combined to form a new company to take over the Lacharnay carbureter interests in Europe, according to an announcement received in this country a few days ago. The sale of the European company to the automobile manufacturers, however, does not affect the American company, which continues to supply the trade through the plant in Paterson, N. J.

Garage Planning

Service Station Arrangements

Plan for a Septic Tank

We received your plan No. 156 for our garage and we thank you for this very much. Now we would like for you to refer to this plan and give us a plan for putting in a cesspool or septic tank. We desire this in southeast corner of basement, and have planned to locate one toilet and washroom which will be for shop force directly over this cesspool if possible to do so. Kindly give us proper size practical for a public garage and correct way to put it in so will not have to clean it out and also proper way to drain. We have no city sewerage system here. We are enclosing stamped addressed envelope for your reply and will appreciate your immediate reply as we have the ground broken and ready to put the plant in.—Jefferson Highway Garage, Mound City, Kan.

We are showing you two suggestions for septic tanks and recommend them rather than a cesspool, though cesspools can be used if your soil is sand or gravel and carries away the water.

The value of a septic tank lies in the fact that the sewage stands for a considerable time and decomes from the action of bacteria to such an extent that it becomes no longer a menace to health. To accomplish this the size of the tank must be large enough to retain the material the required length of time before it is expelled.

We would recommend something along a long tank containing three compart- the line shown in sketch B, consisting of ments. The first two sections are identical, sewage enters at C and immediately separates, the sediment passing to the bottom and the grease and oil rising to the surface, leaving the clear liquid in the center D. Gravity holds the sediment at the bottom and the wall E holds the grease from passing to the second section. In the section the process of separating is repeated and should be pretty

MOTOR AGE is receiving many inquiries or garage plans which do not give sufficient information to permit an intelligent reply. There are certain things which should be known to lay out the proper plan for a garage, and inquiries are urged in asking for such plans to be sure to include the following information:

Rought pencil sketch showing size and shape of plot and its relation to streets and alleys.

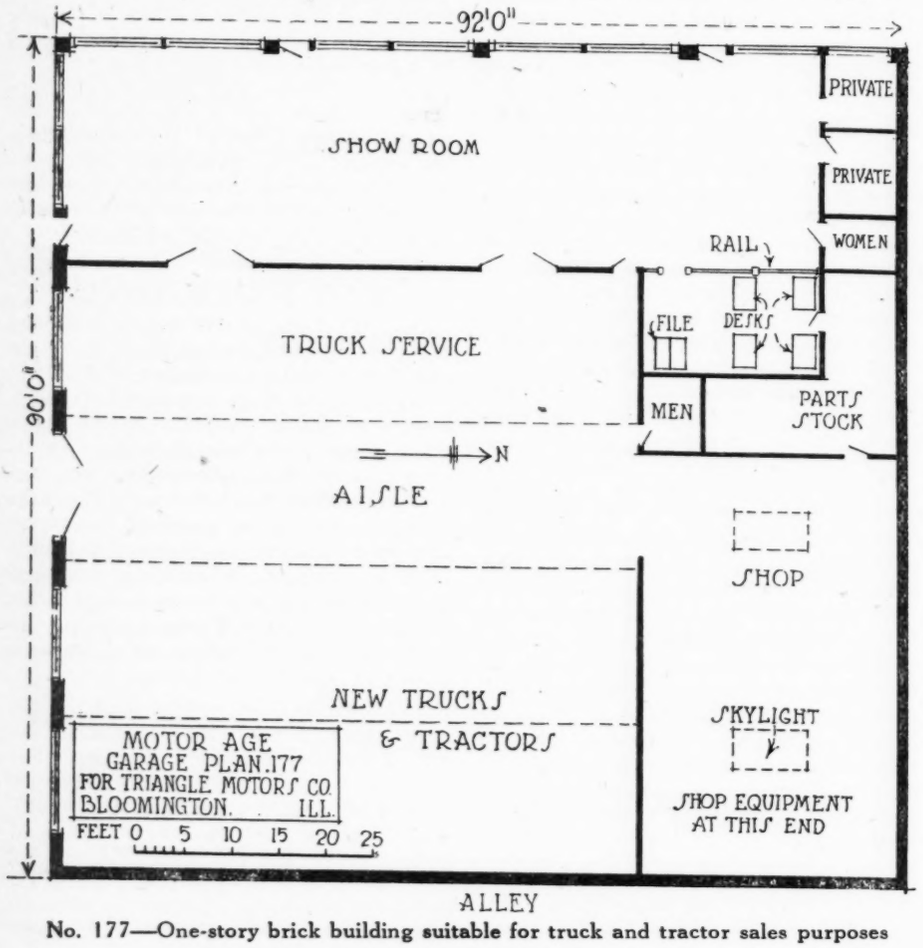
What departments are to be operated and how large it is expected they will be.

Number of cars on the sales floor.

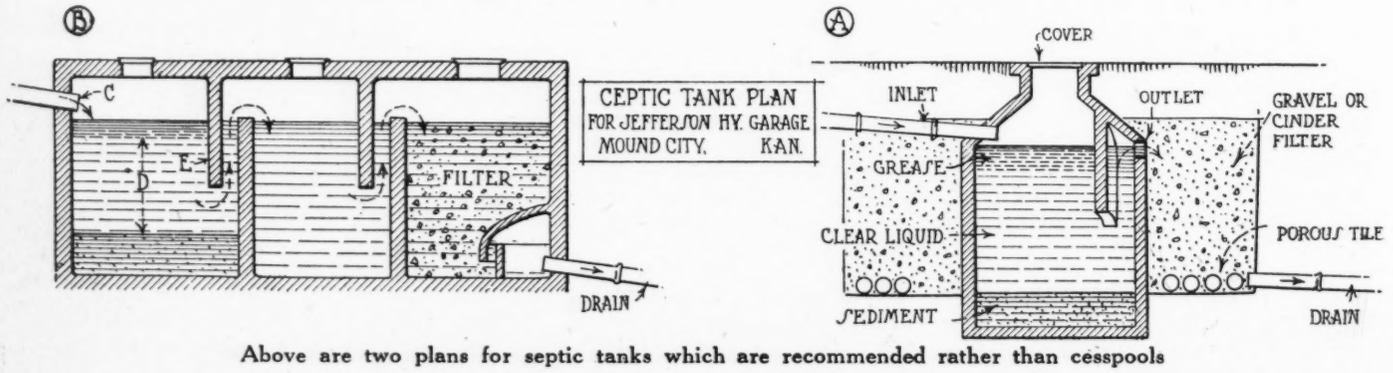
Number of cars it is expected to garage.

Number of men employed in repair shop.

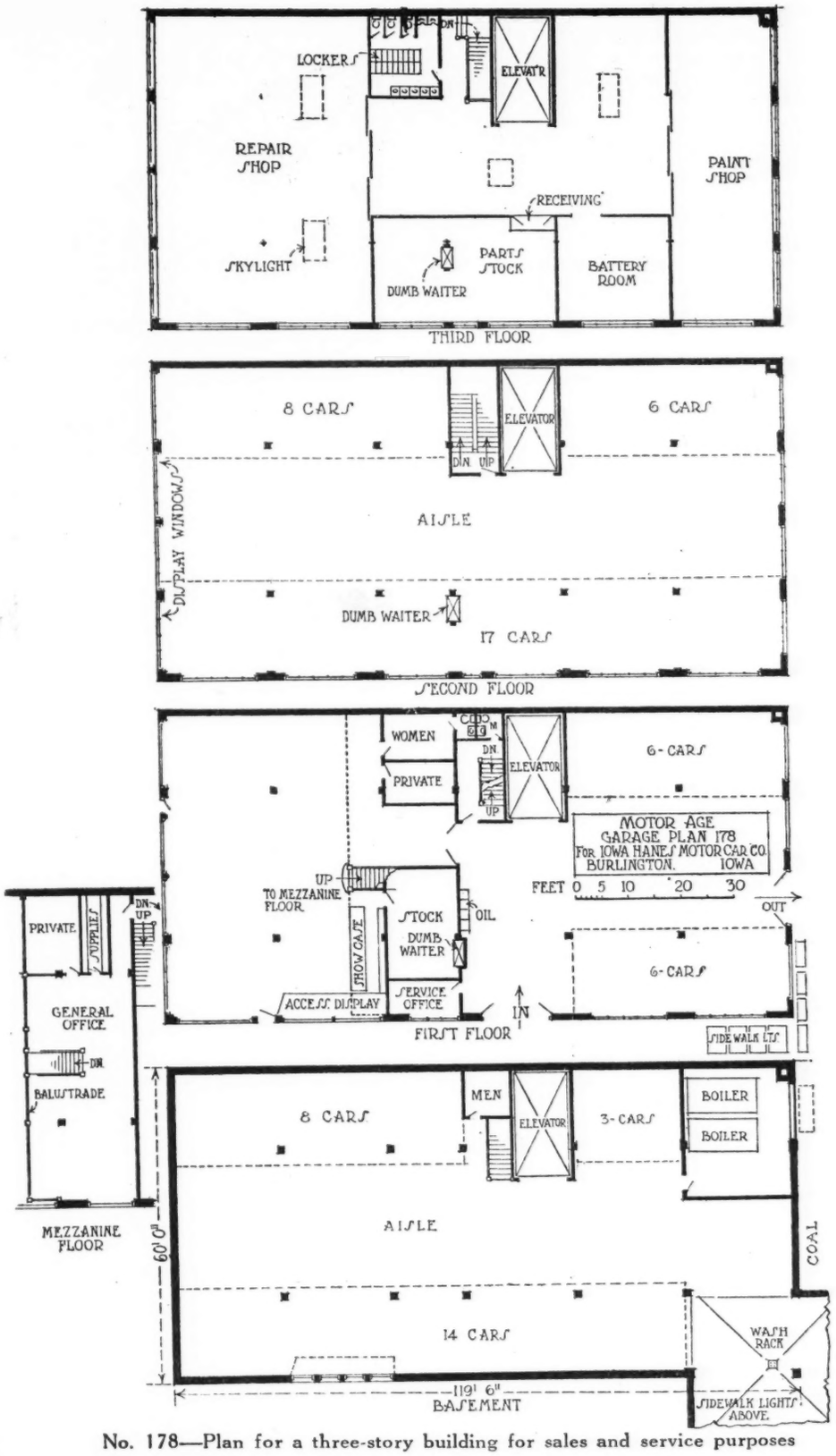
And how much of an accessory department is anticipated.



No. 177—One-story brick building suitable for truck and tractor sales purposes



Above are two plans for septic tanks which are recommended rather than cesspools



No. 178—Plan for a three-story building for sales and service purposes

complete if there is not too large a volume or if the tank is large enough. You can treat the liquid in this tank chemically with iron sulphate solution or lime water ,which coagulates all the organic matter in the solution and settles it to the bottom. Very little of these solutions are needed, only a drop or two per gallon of liquid, but it must be arranged so that it is continuously supplied to the liquid as it enters.

The third compartment is dispensed against allowing the system to become with sometimes but a good precaution filled up in operative. If number one section becomes filled with sediment and grease to such an extent that it fails to function, the original mixture passes to section two and if solids pass this section they will clog the filter and the whole thing will overflow.

Figure A represents a cesspool surrounded with a filter bed for use in heavy soil. If this is built large enough it will answer the same purpose as figure three. It is impossible to build anything that will not need cleaning out and to get proper action your septic tank like figure B should be thirty feet long by six feet wide and six feet deep. Drain from wash rack should not run into this tank.

No. 177

FOR TRUCK AND TRACTOR SERVICE

Attached find sketch of ground upon which we are planning to erect a one story brick building suitable for tractor and truck sales purposes. The dimensions of this lot are 92 by 90 ft. The 92 ft. side fronts on the main street of the town while the 90 ft. side faces a side street and to the rear of the lot is an alley approximately 15 ft. wide.

We would appreciate it if you could furnish us with plans which would be suitable for handling to the greatest advantage, utilizing the smallest possible floor space for show and salesroom, a line consisting of two large tractors and a medium size tractor also, three trucks not larger than two ton.

It will be necessary to make provision for two small private offices and one general office to accommodate four clerks. In addition it must be taken into consideration that a certain amount of space will be required for repair stockroom for above lines and storage room for trucks, tractors, plows and oil. No tractors will be rebuilt but a small amount of service will be given trucks. We would like particularly to have your opinion as to whether or not it would be advisable to have a driveway entrance on the main street or devote it entirely to display room and office purposes.—V. C. Haynes, Bloomington, Ill.

If you were selling passenger cars and conducting a garage for the accommodation of transients it would be advisable to have your entrance on the main street, especially in view of the extensive frontage you have. But dealing as you do in trucks and tractors there is no real advantage in the front entrance and one might find many disadvantages.

The arrangement we show is, we believe, the logical one, it allows all your truck and tractor models to be spread out along the front windows without occupying more space than is necessary.

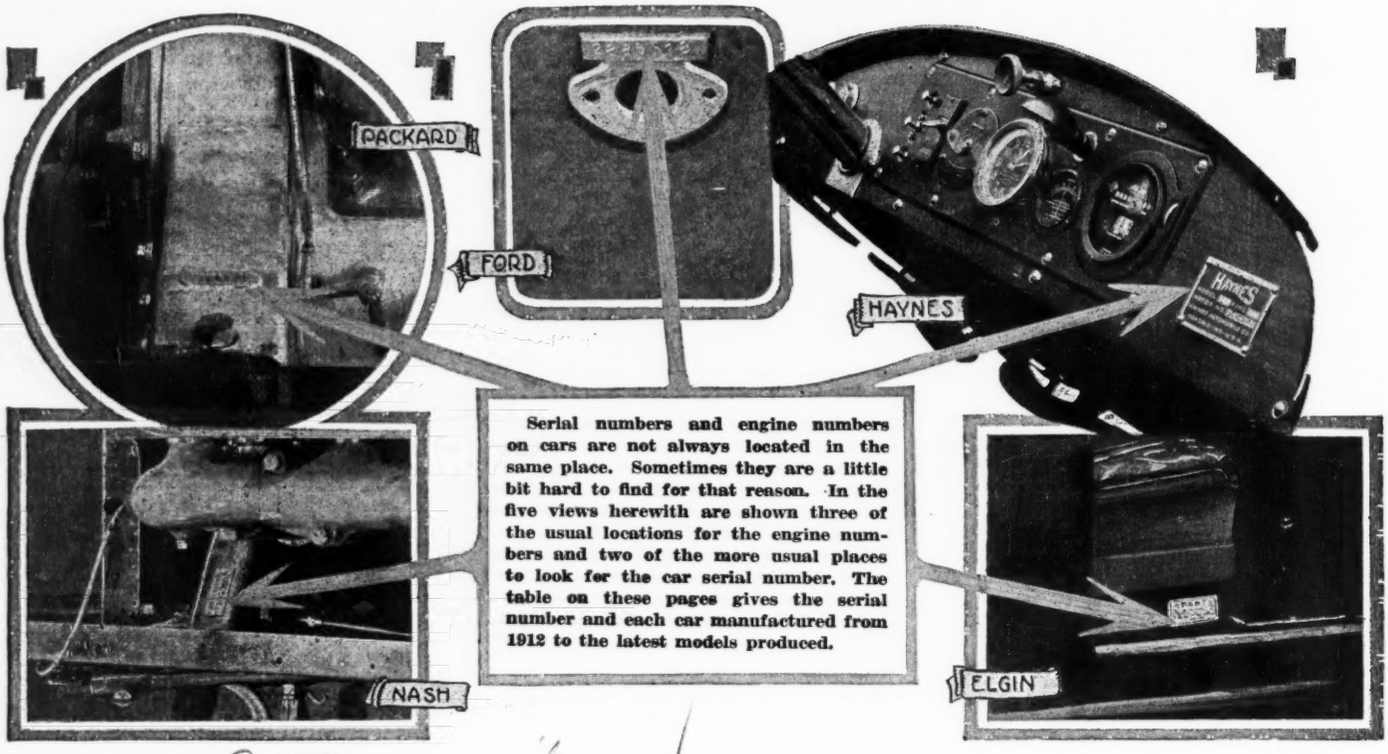
No. 178

FOR THREE-STORY BUILDING

We want your ideas for a three story and basement building to be used in sales and service of passenger cars and trucks. The basement and second floor will be used for storage with shops on the third floor. The sales room on the main floor should accommodate six cars with mezzanine floor at rear for office and accessory store on the corner.—Iowa Haynes Motor Car Co., Burlington, Iowa.

This has been a hard plan to arrange, but we believe the results are satisfactory. The posts are arranged to give the minimum amount of trouble, the central span of 28 ft. is rather great but is worth the extra expense it will cause by giving a wide post-free space where all the maneuvering will be done. The third floor may have posts to support the roof or it may be supported by trusses.

A dumb waiter communicates between the third floor parts stock room and the small accessory and small parts stock room on the main floor.



Serial numbers and engine numbers on cars are not always located in the same place. Sometimes they are a little bit hard to find for that reason. In the five views herewith are shown three of the usual locations for the engine numbers and two of the more usual places to look for the car serial number. The table on these pages gives the serial number and each car manufactured from 1912 to the latest models produced.

Automobiles

Passenger Car Serial Numbers

Motor Age Maintenance Data Sheet No. 78

One of a series of weekly pages of information valuable to service men and dealers—Save this page

ALLEN

Year	Model	Cyls.	Price	Serial Numbers
1914	40	4	$1395	2000-2753
1915	34	4	895	3499-5233
1916	37	4	795	6000-15631
1917	Classic	4	850	
1918	41	4	1095	18000-21000
1919	43	4	1395	Number stamped on front motor cross member
1920	.....	....	.....	50,001 up Number stamped on frame at right front spring hanger

AMERICAN

Year	Model	Cyls.	Price	Serial Numbers
1917	A	6	.....	1-250
1918	B	6	$1375	251-1000
1919	B	6	1865	
1920	.....	....	.....	Number on left side of motor

ANDERSON

Year	Model	Cyls.	Price	Serial Numbers
1914	100-A	6	$1295	
1915	100-A	6	1345	
1916	200-A	6	1435	
1917	300-A	6	1550	
1918	400-A	6	1435	
1919	Series 30	6	1850	
1920	Series 30	6	1850	

APPERSON

Year	Model	Cyls.	Price	Serial Numbers
1913	45	4	$1600	4000-5999
	55	4	2000	
1914	45	4	1785	6000-8499
	45-58	6	2200	
1915	40	4	1350	8500-10500
	45	6	1485	
1916	6-16	6	1550	10501-12000 15000-16000
	8-16	8	1850	12001-13000
1917	6-17	6	1750	16001-17000
	8-17	8	2000	12000-13000
1918	6-18	6	.....	17000 up
	8-18	8	2550	
1919	8-19	8	2800	
	Anniversary	8	4000	18000-21000
1920	8-20	8	2950	
	Anniversary	8	4000	
				Number on right front engine leg

ARGONNE

Year	Model	Cyls.	Price	Serial Numbers
1919	.....	4	$4750	.....-110
1920	.....	4	4750	2011 up

AUBURN

Year	Model	Cyls.	Price	Serial Numbers
1912	6-50	....	$3000	
	40-N	....	1750	Numbers not by years nor in consecutive order
	40-H	....	1650	
	35-L	....	1400	
	30-L	....	1100	
1913	6-50	6	3000	
	6-45	6	2000	
	40-L	4	1650	
	37-L	4	1400	
	35-L	4	1400	
	33-L	4	1150	
1914	4-40	4	1490	
	4-41	4	1590	
	6-46	6	2100	
				Number on side body below front door
1915	4-36	4	1075	
	6-40	6	1500	
1916	6-38	6	1050	
	6-40A	6	1375	
	4-38	4	985	
1917	6-39	6	1145	
	6-44	6	1535	
1918	6-39-B	6	1345	
	6-44	6	1685	
1919	6-39H & 39K	6	1695	Number on floor board in front under cowl
1920	.....	....	.....	

AUSTIN

Year	Model	Cyls.	Price	Serial Numbers
1914-15	66	6	$4000	1400-6075
1915-16	77	6	6000	FO12-F1045
1916-17	66	6	3600	C1003-C2862
1918	12-Cyl.	12	3750	C1003-C2862
Discontinued				Number on instrument board

BEGGS

Year	Model	Cyls.	Price	Serial Numbers
1918	18-T	6	$1530	1018-1108
1919	19-T	6	1580	1019-11609
1920	.....	....	.....	
				Number on front end of frame; engine number plate on left side of motor

Passenger Car Serial Numbers

Motor Age Maintenance Data Sheet No. 79

One of a series of weekly pages of information valuable to service men and dealers—Save this page

BIDDLE

Year	Model	Cyls.	Price	Serial Numbers
1915	C	4	$1700	C200-C299
			1700-	
1916	D	4	1850	D300
1917	D	4	2275	D
1918	H	4	2750	H100-H1099
1919	H	4	2985	H1100-H1179
1920	B-1	4	3950	2000 up
	B-5	4	.....	1500 up

Number on dash; engine number on upper left front crankcase

BOUR-DAVIS

Year	Model	Cyls.	Price	Serial Numbers
916	17	6	$1250	1-267

Number on dash under hood; engine number on left side crankcase

.7	17-B	6	1500	1000-1022

Number on top of seat frame under cushion

918	18-B	6	1850	1100-1104
919	.....	....	.....	1105-1134

Number on dash under hood. No record of 10 or 12 cars built by Shadburn Bros., Anderson, Ind.

	20	6	1595	
1920	.....	....	1700	1 up
			9/1/19	
1920	.....	....	.....	

Number on front seat base opposite left hand door; engine number on left side crankcase

BREWSTER

Year	Model	Cyls.	Price	Serial Numbers
1915	41	4	.....	
1916	41	4	.....	41001-41242
1917	41	4	.....	
1918	41	4	.....	
1919	91	4	.....	91242-91241
1920	.....	4	.....	91243 up

Number plate on front of dash

BRISCOE

Year	Model	Cyls.	Price	Serial Numbers
1914-15	B-15	4	.....	101-4000
1916	4-38 & 8-38	4	.....	5001-8751

Number on front seat heel board

	4-24	4	.....	15001-18846
1917	4-24	4	.....	18847-26604
1917-18	4-24	4	.....	26605-34885
1919	4-24	4	.....	34886-45786
1920	4-34	4	$1285	M-550 up

Number on Models B-15, 4-38 and 8-38 on front seat heel board; model 4-24 on dash

BUICK

Year	Model	Cyls.	Price	Serial Numbers
1912	34-35	4	$900	
			1000	
	36	4	900	
	28-29	4	1025	
			1180	
	43	4	1725	
1913	24-25	4	950	
			1050	
	30-31	4	1125	
			1285	
	40	4	1650	

Number on rear cross frame member; engine number on left side of crankcase

1914	B-24-25	4	950	
			1050	
	B-36-37	4	1235	
			1335	
	B-55	6	1985	
1915	C-25-24	4	900	100000-144715
			950	
	C-36-37	4	1185	
			1235	
	C-54-55	6	1635	
			1650	

BUICK (Continued)—

Year	Model	Cyls.	Price	Serial Numbers
1916	D-44-45	6	985	
			1020	144717-254501
	D-54-55	6	1450	
			1485	
1917	D-44-45-46	6	1040	
			1070	
			1440	254502-343782
	D-34-35-37	4	660	
			675	
	E-49	6	1385	
1918	E-4-34-35	4	795	
	E-6-44	6	1265	
	E-6-45-46	6	1265	
			1695	343783-480995
	E-6-49-50	6	1495	
			2175	

Number on left front side of frame member; engine number on left side crankcase

1919	H-44-45	6	1495	
	H-46-47	6	1985	
			2195	480996 up
	H-49-50	6	1785	
			2585	

Number on rear end of left frame member; engine number on left side crankcase

CADILLAC

Year	Model	Cyls.	Price	Serial Numbers
1912	1912	4	$1800	61006-75000
1913	1913	4	1975	75001-90018
1914	1914	4	1975	91005-99999
				A1-A5008
1915	Type 51	8	1975	A6000-A19001
1916	Type 53	8	2080	A20000-A38003
1917	Type 55	8	2080	
	before Dec. 14, 1917		$2240	55-A1-55-S2
	after Dec. 14, 1917			
1918-19	Type 57	8	3220	57-A1-57-1000—57-TT-146
1920	Type 59	8	3490	59-A-1

Number on left front of engine in four-cylinder models. Number back of the right cylinder block on eights. For 1917 and 1918 the figures in front of letter indicate type of car, the number following letter the number of engine for that particular letter. There are 1000 numbers for each letter of the alphabet

CAMPBELL

Year	Model	Cyls.	Price	Serial Numbers
1918	.....	4	$ 835	1-537
1919	C-4	4	1000	538 up

Number plate on left side of dash under hood

CASE

Year	Model	Cyls.	Price	Serial Numbers
1912	M	4	$2050	15000-16224
1913	N	4	1500	19001-20253
	O	4	2200	22001-22750
1914	O	4	2300	
	R	4	1250	22751-26333
	S	4	1850	
1915	R	4	1350	26334-28340
1916	T	4	1190	28341-31550
1917	T-17	4	1190	31351-32354
1918	U-18	6	1875	32355-34856
	U-19		2100	
1920	V	6	2400	34857 up

Number on dash and on front cross bar of frame

Tire and Rim Styles

Motor Age Maintenance Data Sheet Help

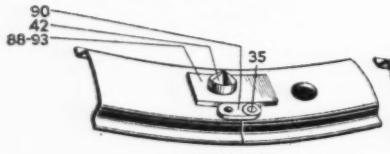
This Page Shows Some of the More Standard Rim Styles Listed in the Tire & Rim Size Data Sheets in Motor Age

Jaxon, Detroit and Perlman

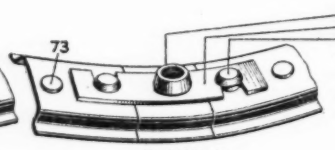


Symbol 101499
Solid Clincher Demountable
52—Valve Stem Bushing Drive

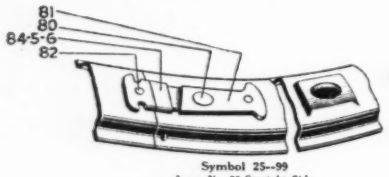
Symbol 111499
Solid Clincher Demountable
Depression at Valve Drive



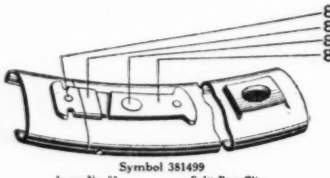
Symbol 19—99
Standardized Diagonal Split Straight Side
35—Safety Latch Rivet 90—Safety Latch
42—Drive Stud 93—Channel Lock for 3½" Rims
88—Channel Lock for 4" and 4½" Rims



Symbol 22—99
Detroit Straight Side
70—Lock Plate 72—Valve Stem Bushing
71—Stud for Lock Plate 73—Drive Stud

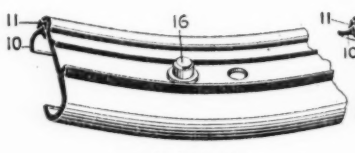


Symbol 25—99
Jaxon No. 25 Straight Side
80—Cam Plate Stud 81—Cam Plate
82—Lock Plate Rivet

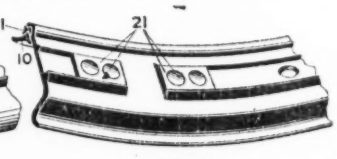


Symbol 381499
Jaxon No. 38 Split Base Clin.
84—Lock Plate for 4½" Rim 85—Lock Plate for 4" Rim
86—Lock Plate for 3½" Rim

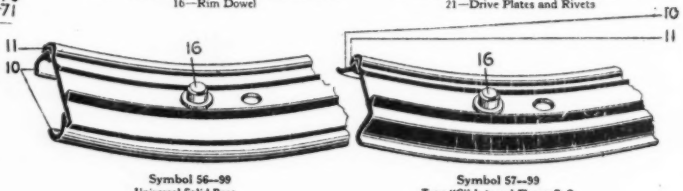
Firestone



Symbol 54—99
Type "A" Integral Flange Clin.
10—Side Ring "B" 11—Lock Ring "C"
16—Rim Dowel



Symbol 55—99
Truck Type Integral Flange S. S.
10—Side Ring "B" 11—Lock Ring "C"
21—Drive Plates and Rivets



Symbol 56—99
Universal Solid Base
10—Side Ring "B" 11—Lock Ring "C"
16—Rim Dowel

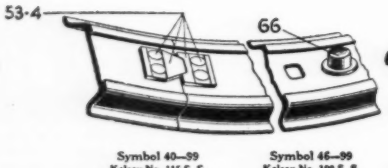
Symbol 57—99
Type "C" Integral Flange S. S.
10—Side Ring "B" 11—Lock Ring "C"
16—Rim Dowel



Symbol 58—99
Type "E" Split Base S. S.
16—Rim Dowel 18—Latch & Rivets 3½" Rim
17—Cam Button 19—Latch & Rivets 4" & 4½" Rim

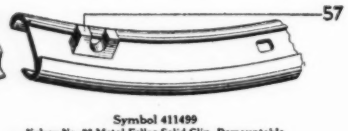
Symbol 59—99
Type "F" Solid Clin. Dem.
16—Rim Dowel

Kelsey

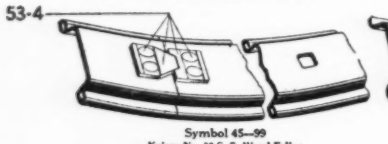


Symbol 40—99
Kelsey No. 115 S. S. Metal Felloe
53—Lock & Rivets for 3½"
54—Lock & Rivets for 4" & 4½"

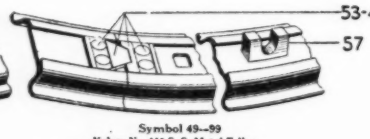
Symbol 46—99
Kelsey No. 100 S. S. Wood Felloe
66—Drive Stud



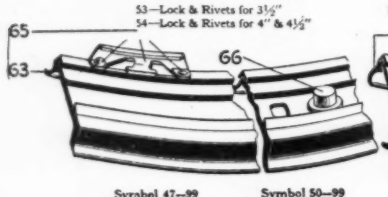
Symbol 411499
Kelsey No. 88 Metal Felloe Solid Clin. Demountable
57—Drive Block



Symbol 45—99
Kelsey No. 30 S. S. Wood Felloe
53—Lock & Rivets for 3½"
54—Lock & Rivets for 4" & 4½"



Symbol 49—99
Kelsey No. 110 S. S. Metal Felloe
53—Lock & Rivets for 3½" 57—Drive Block
54—Lock & Rivets for 4"



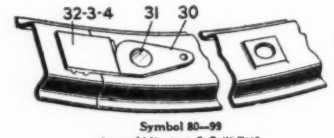
Symbol 47—99
Kelsey Perm. S. S. Wood Felloe
63—Lock Ring 65—Lock & Rivets
66—Drive Stud

Symbol 50—99
Kelsey No. 120 S. S. Metal Felloe

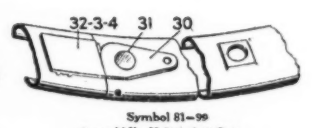


Symbol 48—99
Kelsey Universal Wood Felloe
62—Rev. Side Ring 65—Lock & Rivets
63—Lock Ring 66—Drive Stud

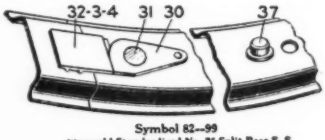
Stanweld



Symbol 80—99
Stanweld No. 21 S. S. Split Base
30—Cam Lock 33—Lock Plate for 4"
31—Cam Lock Rivet 34—Lock Plate for 4½"
32—Lock Plate for 3½"

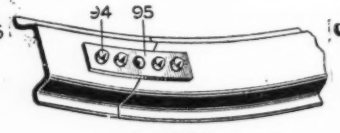


Symbol 81—99
Stanweld No. 22 Chn. Split Base
30—Cam Lock 33—Lock Plate for 4"
31—Cam Lock Rivet 34—Lock Plate for 4½"
32—Lock Plate for 3½"



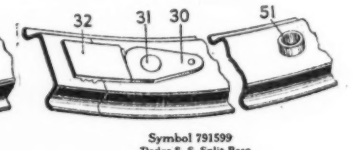
Symbol 82—99
Stanweld Standardized No. 76 Split Base S. S.
30—Cam Lock 33—Lock Plate for 4"
31—Cam Lock Rivet 34—Lock Plate for 4½"
32—Lock Plate for 3½" 37—Drive Stud

Baker



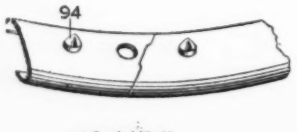
Symbol 70—99
Baker Angle Split S. S.
94—Drive Stud 95—Anchor Plate

Dodge

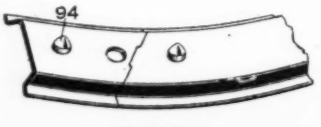


Symbol 791599
Dodge S. S. Split Base
30—Cam Lock 32—Lock Plate
31—Cam Lock Rivet 51—Valve Drive Bushing

Parker

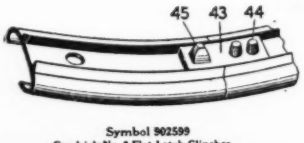


Symbol 75—99
Parker Clin. Split Base
94—Drive Stud

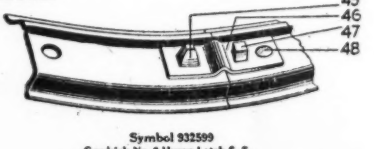


Symbol 76—99
Parker S. S. Split Base
94—Drive Stud

Goodrich



Symbol 902599
Goodrich No. 8 Flat Latch Clincher
43—Flat Latch 44—Oblong Drive Stud
45—"V" Shape Lug



Symbol 932599
Goodrich No. 9 Hump Latch S. S.
45—"V" Shape Lug 47—Square Head Lug
46—Hump Latch 48—Rivet

Tire and Rim Sizes

Motor Age Maintenance Data Sheet No. 77

One of a series of weekly pages of information valuable to service men and dealer—Save this page

1918 Cars (Continued)

CAR AND MODEL	Make of Tire	Size of Tire	Style of Bead	Type of Rim	Make of Rim
Saxon, S-4		32x3½		S. S.	Stanweld
Sayers, AP	Goodyear	32x4	S. S.	E	Firestone
Scripps-Booth		32x4		Q. D.	
Seneca, D	Goodrich Firestone	30x3½	Clincher	Clincher	Prudden
Simplex					
Singer, 18	Goodyear	35x5	Clincher		
Standard, G	Stanweld	34x4½		Stanweld	Stanweld
Stanley, 735		35x4½		S. S.	Firestone
States		32x3½		S. S.	Firestone
Stearns, SKL-4	Goodyear	34x4	S. S.		Goodrich
Stearns, SK-8	Goodyear	35x4½	S. S.		Goodrich
Stephens, 70		32x4 33x4½	S. S.		Stanweld Kelsey
Studebaker, ED-6	Goodrich	35x4½		Q. D. S. S.	Kelsey
Studebaker, SF-4	Goodrich	34x4		Q. D. S. S.	Kelsey
Stutz		32x4½		S. S.	
Templar, 445	Goodrich Cord Goodyear Cord Firestone Cord	32x4		S. S.	Parker
Texan		33x4		Demountable	
Tulsa, D-1	Goodrich	33x4	S. S.		Stanweld
Velie, 38	Firestone	32x4		S. S.	Goodyear
Velie, 39	Goodyear	33x4½		S. S.	Firestone
Victor, C-17		30x3½		Demountable	
Westcott, S-18		34x4	S. S.		Firestone
White, GM	Goodrich Cord Goodyear Cord	37x5		Q. D. C	Firestone
Willys-Knight, 88-4		34x4½ 35x5		No. 21 Dem. S. S.	Stanweld Houk
Willys-Knight, 88-4		34x4½		No. 21 Dem. S. S.	Houck
Willys-Knight, 88-8		34x4½		S. S.	Stanweld
Willys-Six, 89		33x4½		No. 21 Dem. S. S. Q. D. S. S.	Stanweld Budd & Houk
Winton, 22	Standard	35x5	Clincher	A	Firestone
Winton, 22A	Standard	34x4½	Clincher	A	Firestone
Wolverine		32x4½		Q. D. C.	Firestone
Woods Gas-Electric		35x4½		Q. D. C.	Stanweld
Yale, M		34x4		Q. D.	Goodyear

1919 Cars

Allen, 41	Firestone Goodyear U. S.	32x3½ 33x4	S. S.	S. S.	Firestone
American, B	Firestone	32x4			Firestone
Anderson			S. S.	Q. D.	Firestone
Apperson, 8-19	Goodyear Cord Goodrich Cord Firestone Cord	33x4½ 32x4½	S. S.	Demountable or Houk Wire Wheel	Firestone or Houk Wire Wheels
Auburn, 6-39-H	Goodrich	First 225, 34x4 Balance, 33x4	S. S.		Firestone
Auburn, 6-39-K	Goodrich	First 225, 32x4 Balance, 33x4			Firestone
Austin	Goodrich Cord	34x4½		Q. D.	Firestone
Beggs	Goodrich	33x4	Front, Smooth Rear, Safety Bead	S. S.	Firestone
Biddle, H	Firestone Cord Silvertown Cord	32x4	Q. D.	Q. D. Clincher	Stanweld No. 52
Bour-Davis, 18-B	Goodyear	33x4½	S. S.	Demountable	Perlman
Bour-Davis, 20	Goodyear	32x4	S. S.	Demountable	Perlman
Brewster, 91	Kelly-Springfield	34x4½			Firestone
Briscoe, 4-24	Ajax and Miller	30x3½	Clincher	Clincher	Perlman

ABBREVIATIONS:
S. S.—Straight Side. Q. D. C.—Quick Demountable Clincher. Dem.—Demountable. Q. D. D.—Quick Demountable Detachable.

The Motor Car Repair Shop

Practical Maintenance Hints

Shop Order Tube

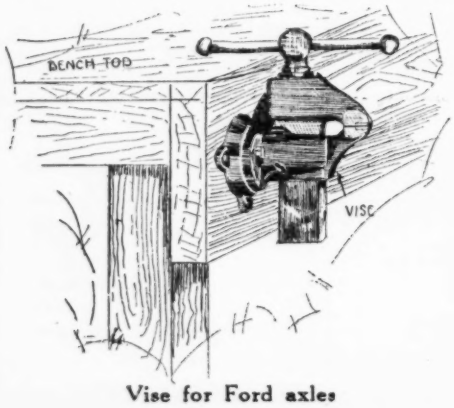
In a service station where the stock room is on the first floor and the shop occupies two or three floors above it, a tube for delivering orders from the shop floors to the stock room or to the office is a time saver. Such a tube may be made out of galvanized iron and be about 2 in. in diameter. At each floor it should be provided with a circular sliding door as illustrated. This door is usually kept shut and is only opened when an order is to be dropped in or when a workman wishes to speak to the stock clerk. A bell is used for signaling the stock room. It is possible to roll the order up and twist it slightly so that it will slide through the tube without the need of a container to carry it.

Keeping Tools

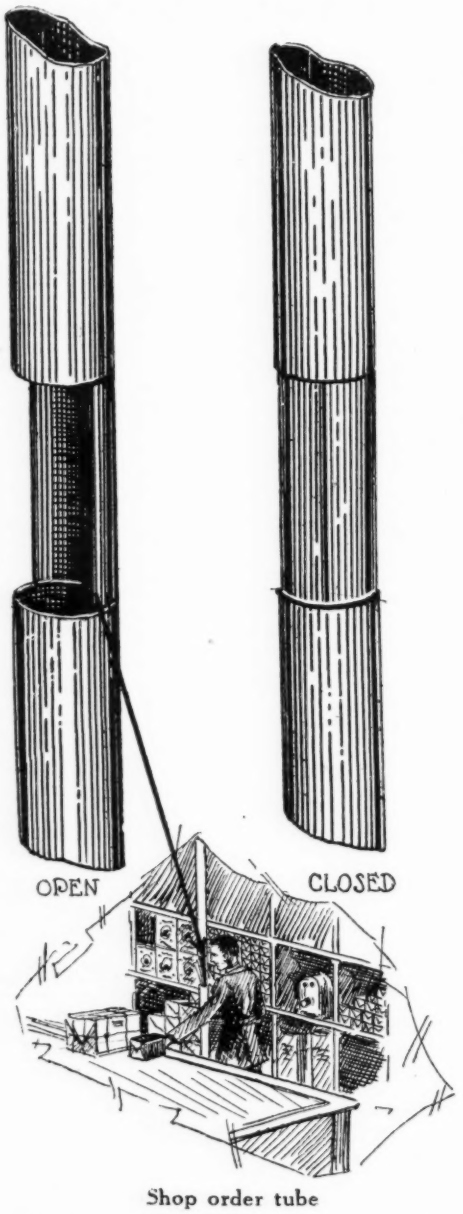
To operate a service station, regardless of size, at highest efficiency means that every workman must have the proper tools and not be forced to use makeshifts or to borrow. Especially is this true of work on Ford cars where the operations are so specialized. At the same time where many men are employed it is difficult to prevent theft of tools, let alone loss through borrowing.

The best way, perhaps, to insure that each workman has a full set is to supply him with it. In which case each workman should have exactly the same set of tools, thereby minimizing the temptation of the workmen to steal or borrow. A tool inspection should be held every Saturday noon and Monday morning, with the requirement that any tool found missing Saturday must be bought by the workman before he can start in Monday. The Monday inspection checks this.

Special tools which are too large or too expensive for the workmen's kits should be placed on a tool board in the shop. The outline of each tool being painted in red under the tool location on the board. Each night when the shop closes the foreman or superintendent should inspect this board and see that all tools are in place before the workmen are allowed to depart.



Vise for Ford axles



Shop order tube

Where the service station is large enough to be divided into several departments or is situated on several floors there is the possibility that some of these tools will be borrowed by men from other floors and not returned. The same applies to other floor equipment such as fire buckets, oil pails, waste cans and the like. To minimize this difficulty the equipment belonging to a certain floor or department should be assigned a certain letter and all the tools and other equipment should have this letter painted on them. Therefore if a tool is borrowed it is very easy to find.

Taking Stock at a Glance

Everyone appreciates the shortcomings of the ordinary stock bins. Their far corners are dark, many of them are inaccessible, and taking stock is a considerable job and often neglected because it is so much trouble.

A radical departure to overcome these troubles is that used for some time by the Bronx County Auto Co., one of the largest Ford dealers in New York City.

The main part of the stock is housed in boxes placed on the floor. These boxes are specially designed for the purpose and are about 1 ft. by 2 ft. by 10 in. deep, some being used that way and others being divided into halves or quarters. About 4 ft. above these are smaller boxes about 6 in. square. The big boxes are used for all sorts of major parts such as pistons, connecting rods, ring gears, and the smaller boxes are for nuts, bolts, ignition parts and the like.

At first glance it may be thought that such a method of housing stock is very wasteful of space but such is not the case for all the stock required to run this large service station except, of course, such bulky things as wheels, axles, cushions and so on, are carried in about forty feet of these bins.

The advantage should be obvious. Extra convenience is afforded in picking out parts and time is saved. Furthermore all compartments are continually under the eye of the stock clerk so that he always knows when the stock of a certain article is getting low. With the usual design of bins he might miss this fact.

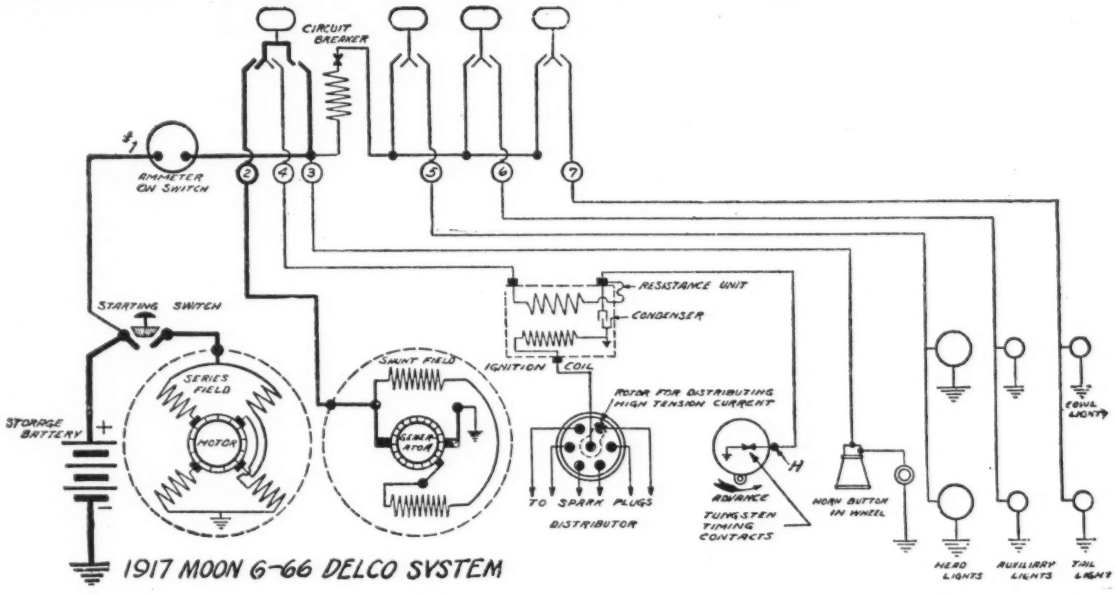
Vise for Ford Axles

For repair work on Ford front axles suitable means is necessary for holding the axle. According to the superintendent of a large Ford service station the best device for the purpose is the usual bench vise but mounted on the bench in an unusual way—with the top faces of the jaws towards the worker and the spindle of the screw vertical instead of horizontal.

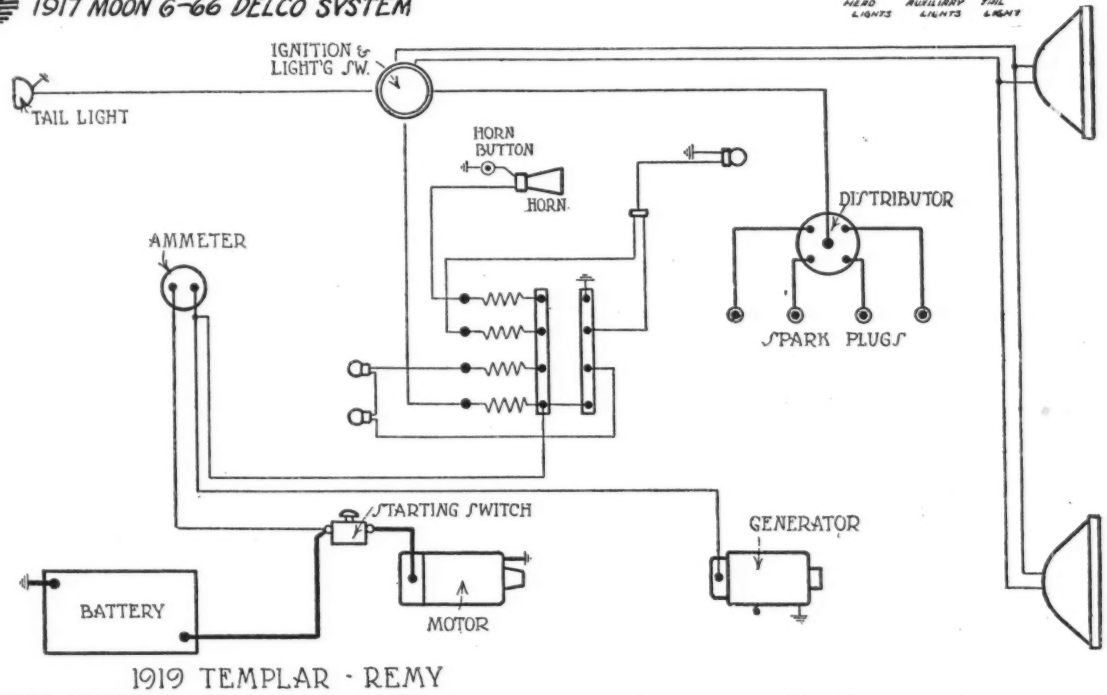


A good way to keep stock

Motor Age Weekly Wiring Chart No. 62



1917 MOON 6-66 DELCO SYSTEM



1919 TEMPLAR - REMY

THIS WEEK

1917 Moon

1919 Templar

Abbott—March 20-27, '19
Alco—April 24, '19
Allen—Dec. 18, '19
Alter—Nov. 14, '18
Apperson—March 6, '19
Auburn—Nov. 27, '19
Briscoe—Oct. 16, '19
Buick—Nov. 21, '18; April 3, '19; Oct. 23, '19
Cadillac—Dec. 19, '18
Cartercar—May 1, '19
Case—Feb. 27, '19; Oct. 2, '19
Chalmers—Feb. 20, '19; March 27, '19; Nov. 27, '19
Chandler—April 3, '19
Chevrolet—Nov. 28, '18; March 27, '19
Cole—Jan. 23, '19; April 3, '19
Crow-Elkhart—June 26, '19
Cutting—Nov. 6, '19
Daniels—May 8, '19; Dec. 4, '19
Davis—May 8, '19; Dec. 4, '19
Detroiter—March 6, '19
Dodge—Dec. 12, '18
Dorris—Dec. 11, '19
Dort—March 13, '19
Elgin—Feb. 27, '19
Empire—March 13, '19; Oct. 30, '19
Essex—Oct. 23, '19
Ford—Jan. 30, '19; Feb. 6, '19; May 15, 22, '19
Franklin—June 19, '19; Dec. 11, '19
General Battery Charging—May 29, '19; Sept. 25, '19
General Magneto Diagram—June 5, '19
Grant—Feb. 27, '19; March 27, '19
Haynes—Sept. 4, '19; Oct. 9, '19
Henderson—April 3, '19
Hudson—Dec. 5, '18; May 1, '19
Hupmobile—Feb. 13, '19; Oct. 16, '19
Internal Connections—July 10-17-24, '19
Interstate—March 13, '19
Keeton—Nov. 6, '19
King—July 3, '19
Kissel—July 3, '19
Krit—Feb. 6, '19
Lexington—April 24, '19; Jan. 1, '20
Liberty—Jan. 1, '20
Little—March 20, '19
Locomobile—Jan. 23, '19; April 17, '19
Marmon—Jan. 9, '19; Dec. 25, '19; Jan. 22, '20
Maxwell—Jan. 16, '19; Aug. 14, '19
Marion—March 6-20, '19
Mercer—Jan. 23, '19; Aug. 28, '19; Nov. 27, '19
Michigan—March 20, '19
Mitchell—Jan. 9, '19; Jan. 8, '20
Monroe—Oct. 30, '19
Murray—May 1, '19
National—June 19, '19
Oakland—Jan. 2, '19; Oct. 16, '19
Oldsmobile—Jan. 23, '19
Olympian—Jan. 22, '20
Overland—Nov. 7-14, '18
Owen-Magnetic—Sept. 18, '19
Packard—June 19, '19; July 31, '19
Paige—July 3, '19
Paterson—March 20, '19; June 26, '19; July 9, '19
Pierce-Arrow—Oct. 2, '19
Premier—April 10, '19
Pullman—April 10, '19
Regal—Feb. 6, '19; April 10, '19
Reo—Feb. 27, '19; Aug. 21, '19; Oct. 9, '19; Nov. 13, '19
Saxon—April 17, '19
Scripps-Booth—Dec. 28, '18; Jan. 15, '20
Simplex—April 17, '19
Stanley—June 26, '19
Stearns-Knight—April 24, '19; Jan. 8, '20
Studebaker—Dec. 26, '18; Dec. 25, '19
Stutz—Jan. 23, '19
Velie—April 24, '19; Sept. 25, '19
Westcott—May 8, '19; Jan. 15, '20
White—Sept. 25, '19
Special Systems for Fords—May 15-22, '19

The Readers' Clearing House

Questions and Answers

Conducted by Roy E. Berg

(Motor Age Editorial Staff)

THIS department is conducted to assist dealers, service stations, garagemen and their mechanics in the solution of their repair and service problems.

In addressing this department readers are requested to give the firm name and address. Motor Age reserves the right to answer the query by personal letter or through these columns.

TIMING OF HARLEY-DAVIDSON

Q—Instruct how to time the engine of a twin cylinder Harley Davidson motorcycle.—A. W. Kemper, Tarkio, Mo.

The timing of the Harley-Davidson twin-cylinder is illustrated in Fig. 1. Cylinder No. 1 is the front cylinder of the motor cycle. If the valves are timed and set according to piston position on cylinder No. 1, the setting will be correct for cylinder No. 2.

FIGURING SIZE OF COMBUSTION CHAMBER

Q—Explain and if necessary show how to figure the size of combustion chambers of I, F L and T-head gas engines. How many pounds pressure per square inch the gas will be compressed when the piston displacement and the size of combustion chamber is known?

2—Are there any other cars besides the Hudson Super Six and Essex that have counterbalanced crankshafts in their engines?

3—Is it absolutely necessary that crankshafts of one and two cylinder engines have counterbalances? If it is not absolutely necessary, would it pay to make the extra cost of having a counterbalanced crankshaft? Does a counterbalanced crankshaft better the performance of an engine besides freeing it from vibration? While it is not necessary to have the crankshaft of four and six cylinder engines counterbalanced, would a counterbalanced crankshaft lengthen the lift of the engine because of freedom from vibration or better the performance, or both, enough to pay for itself? How about eight and twelve cylinder engines? Would it pay there or are the eight and twelve cylinder engines just as good without it? Would it be at all possible to have counterbalances on the crankshaft of eight and twelve cylinder engines?

4—Which is the best balanced engine among four, six, eight and twelve cylinder engines, the six or the twelve? Which is the next best balanced?—Alvin Steinberg, Tilleda, Wis.

1—When an engine is being designed the percentage volume of the combustion space has to be decided and runs in most engines from 20 to 25 per cent of the displacement, although there are a few high compression engines with a smaller percentage; also some with higher. In measuring the combustion space in an engine already built the easiest way is to run the piston all the way down in one cylinder and fill the entire cylinder with oil; then run the piston up to its highest point and the amount of oil which you have pushed out of the cylinder is the volume of the displacement, which can easily be checked, and the volume of displacement equal to a certain number of cubic inches is equal in weight to the number of ounces of oil displaced. You can get the exact weight of a cubic inch of oil at the temperature at which you were trying the experiment. Now, with the piston at its high point in the cylinder fill the cylinder again with oil weighing just exactly the amount you put into it. Your previous calculations have shown you the exact relation of the cubic inch to the ounce of oil, so by this means it is easy to get the exact volume of the combustion space of the cylinder.

2—There is a good deal of difference in the meaning of counterbalancing. The Templar, White four, Duesenberg four, Stutz and some cars of older vintage have used and some do use balance weights. The Hudson engineers do not claim, or admit, that the Hudson is merely counter-weighted; they claim much more for it.

3—We do not think it will pay to go to the trouble and expense of attaching counter balance weights to the crankshaft of an engine that is not especially designed to have such weights. Any means of reducing vibration, whether by balance weights or by lightening the reciprocating parts will naturally reduce vibration and prolong the life of the engine and the car as well.

4—There is too much difference of opinion, even among competent designers, to venture an opinion on this topic.

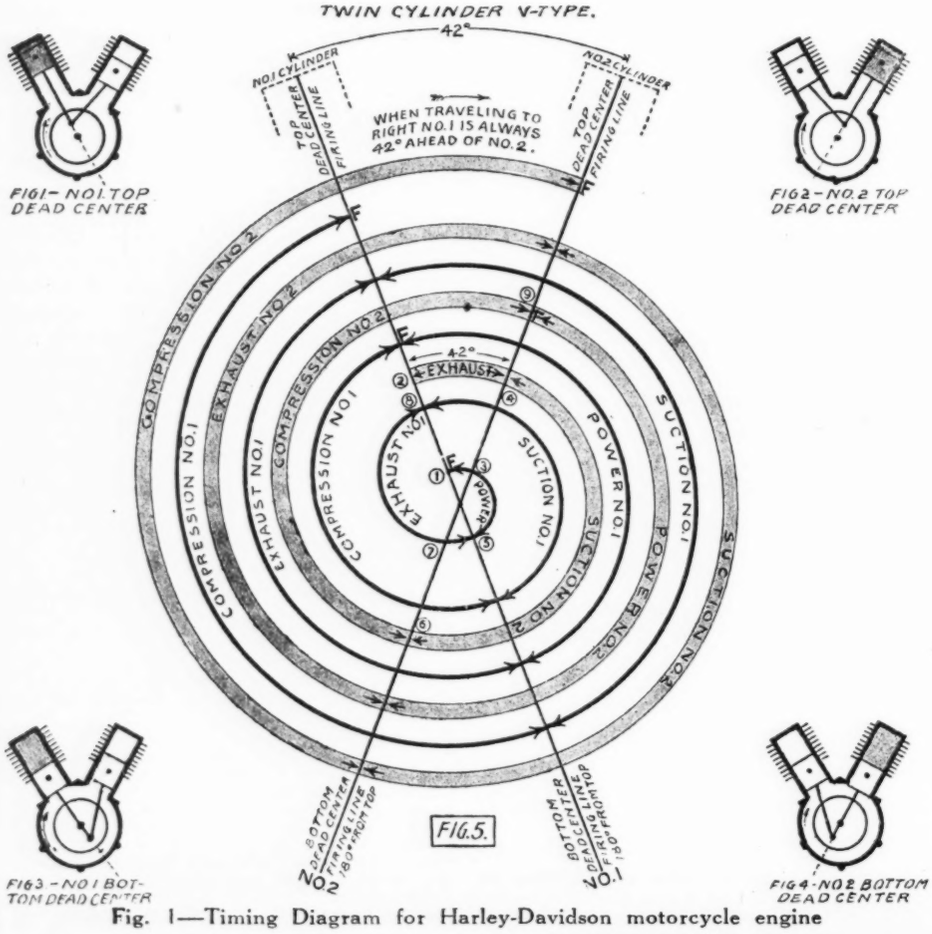


Fig. 1—Timing Diagram for Harley-Davidson motorcycle engine

QUESTIONS ON FORD

Q—How many horse power would a Ford engine develop at 1900 r.p.m., also how much at 2800?

2—How many revolutions per minute

does a Ford engine make for one thousand feet of piston speed per minute?

3—How does the Curtiss OX-5 engine, size 4-inch bore and 5-inch stroke develop 90 hp. at 1400 r.p.m.? How many r.p.m. would it make for one thousand feet piston speed per minute.

4—Theoretically how much speed would an Essex car deevlop with a three to one gear ratio in the rear axle?

5—How does the engine in the Ace airplane with a 2¾-inch bore and 4-inch stroke develop 40 hp. at 1900 r.p.m.?—E. O. Hiles, West Frankfort, Ill.

1—A Ford engine will not turn up 1900 r.p.m., for its limit is 1800 r.p.m., therefore your question cannot be answered.

2—Fifteen hundred.

3—There is nothing remarkable about this power development, because on the N. A. C. C. rating this engine would show 51.2 hp., and it is well known that actual power generally exceeds this formula rating. It requires an engine speed of 1250 r.p.m. to take off with this outlet, so it is not difficult to see what power is required for the initial performance. At 1000 ft. of piston travel it would run 1200 r.p.m.

TIMING AN EIGHT CYLINDER STEARNS KNIGHT

Q—Instruct how to time valves on a Stearns-Knight 8 cylinder engine.

2—What is the correct valve setting on the King-Eight engine as the fly-wheel is only marked for dead centers.—Martin Hill, Duluth, Minn.

To time the valves on the Stearns-Knight eight-cylinder proceed as follows:

Turn the engine over by hand until the mark 1-4 R. H. is in line with the D C mark on the crankcase. Turn the eccentric shaft and sprocket until the arrow is in line with the guide mark on the front end of the chain housing. This is shown in Fig. 3. Then slip on the driving chain. This provided you have had the engine down.

If you want to check up on the timing, put an electric lamp in the No. 1 right hand port of No. 1 right-hand cylinder and stop cranking the instant the light disappears through the port. When this occurs the mark 1-4-R. H. should be in D C line with the crankcase mark. Some repairmen check up on the timing as follows:

When the preceding mark and crankcase mark are in line it signifies that the exhaust port of No. 1 right-hand cylinder is closed, and to determine this a strip of paper is placed through the port and the engine slowly turned over. The instant this paper is pinched the exhaust valve closed and the marks should be exactly in line. A complete cycle of operation of one cylinder of the Knight engine is shown in Fig. 2. In the first position the inlet valve is opening and the second shows it open. In the next position the inlet closes and the fourth position is that when the piston is at the top of the compression stroke. The exhaust valve is shown opening in the fifth position and the next shows the exhaust open. The last position is when the exhaust closes and the fourth position is that when the piston is at the top of the compression stroke.

To assist readers in obtaining as a unit all information on a certain subject MOTOR AGE segregates inquiries in this department into divisions of allied nature. Questions pertaining to engines are answered under that head and so on.

ENGINES

A. W. Kemper.....Tarkio, Mo.
Alvin Stienberg.....Tilleda, Wis.
E. O. Hiles.....Frankfort, Ill.
Martin Hill.....Duluth, Minn.
C. B. Roy.....Lafayette, La.
Hubert Smith.....Memphis, Mo.
H. J. Chatterton.....Farrell, Pa.
Phillip J. Kenny.....New York
H. W. Hamilton.....Dallas, Texas
B. L. Hailles.....Pittsburgh, Pa.
James O. Coffee.....Springfield, Ill.
Ott Huhn.....Kyle, Texas
Clarence Groce.....Divernon Auto Service Co., Divernon, Ill.
Genevieve Edwards.....Searcy, Ark.
A. E. Belden of Thorpe & Heathman.....Warren, Ohio

CARBURETION

O. L. Zive.....Los Angeles, Calif.
Anton J. Vavrik.....Chicago
R. G. Bowman.....Shreveport, La.

THE ELECTRIC SYSTEM

Garage & Auto Service Co.....Michigan City, Ind.
F. A. Raabe.....Fort Jennings, Ohio

MISCELLANEOUS

C. William Hansen.....New York City
F. Swanson.....Salerno, Fla.

ADVANTAGES OF UNIT POWER PLANT

Q—What are the advantages and disadvantages of a unit power plant?

2—Which is regarded as the best type, rear end transmission, amidship or unit power plant? Why? C. B. Roy, Lafayette, La.

1—It is claimed that the unit power plant gives better alignment, greater accessibility and probably saves somewhat in the cost of manufacture, particularly in assembling. Besides, with the transmission farther forward there is less angularity to the drive shaft. There are no essential disadvantages that we know of.

2—The fact that, so far as passenger car design is concerned, the great majority of American makers use the unit power plant would seem to be the best answer to this question. There are a few cars with the transmission on the rear axle and a few more with it amidship.

OVERHAULING A FORD

Q—Desire to overhaul a Ford engine for power and slow smooth running. Do not desire speed but it to run a little faster after it is overhauled. Which is preferable for service, light gray iron

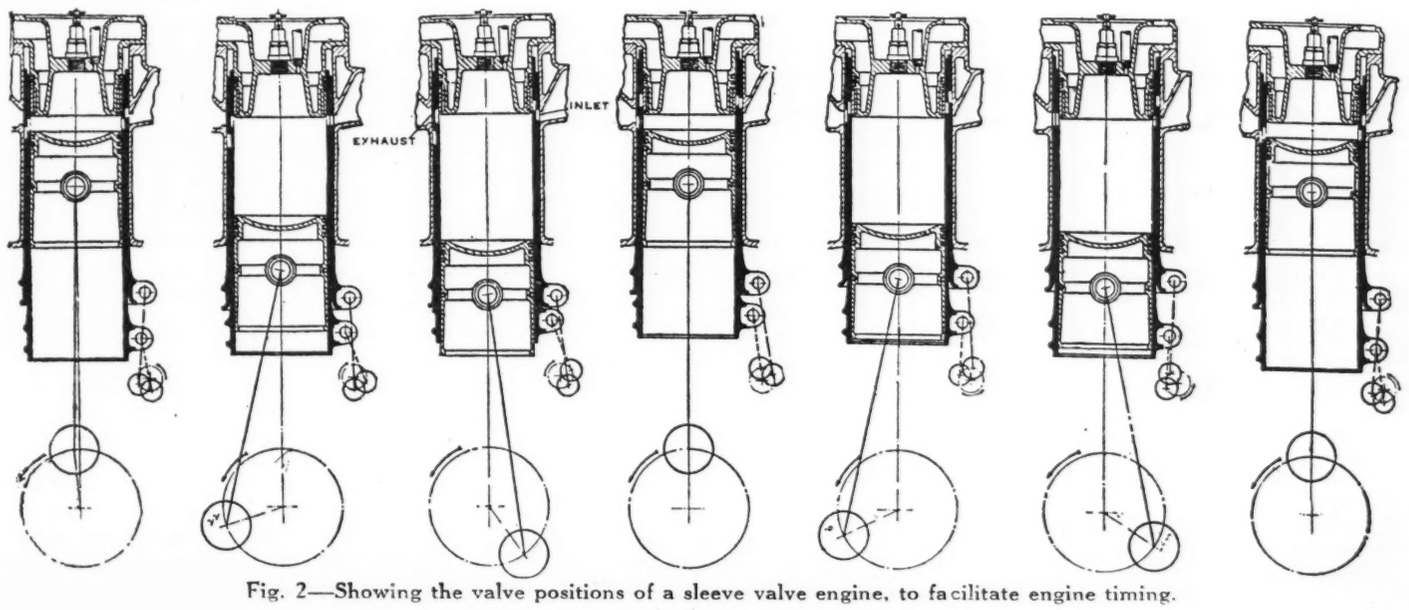


Fig. 2—Showing the valve positions of a sleeve valve engine, to facilitate engine timing.

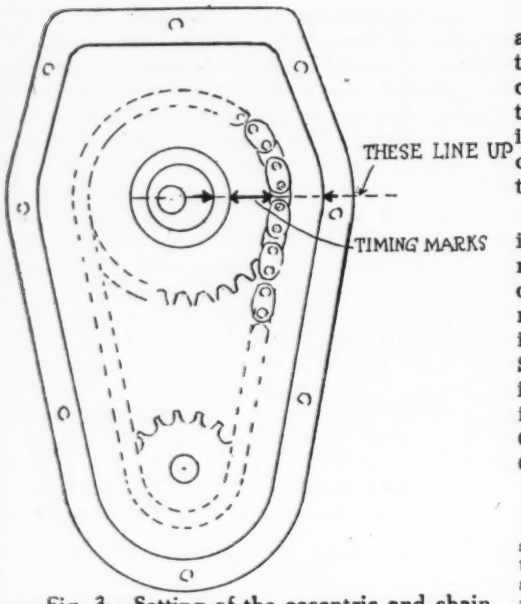


Fig. 3—Setting of the eccentric and chain on a Stearns-Knight engine for the determination of the correct position of the sleeves.

pistons or aluminum? Should counterbalances be used?

2—Should Dodge valves be used? What is the proper way to fit Dodge valves in a Ford block?

3—Instruct how to fit bearings.—Hubert Smith, Memphis, Mo.

1—Good old-fashioned cast iron pistons cannot be beaten for service and ordinary work. So long as an engine is built for iron pistons it is wise to stick to them. For this kind of work you do not need a counterbalanced crankshaft.

2—There is no use in using Dodge valves; the Ford valves will serve you as well as any.

3—While it takes longer to scrape in bearings, if the work is well done, that is the way to fix them. This has been treated in MOTOR AGE several times.

POWER CURVE OF CHALMERS

Q—Pubilsh power curve of engine of four-passenger, six-cylinder Chalmers car, model 29, 1915.

2—What is the bore and stroke of the engine of same model?

3—What is the size of the valves on this car?—H. J. Chadderton, Farrell, Pa.

1—See Fig. 4.

2—The bore and stroke of this engine is 4 by 5.5 in.

3—The valve diameter measured at the throat is $2\frac{5}{16}$ in. The stem diameter is $\frac{7}{16}$ in. and $7\frac{11}{16}$ in. long.

FITTING PISTON RINGS

Q—What clearance should be between piston rings in fitting ring to cylinders, any difference for trucks and touring cars.

2—Show how to time a Ford and what space or clearance should be between pushrods and valve stems?

3—Instruct how to crank a car. Is it a trick or is it strength or both?

4—Where could I learn to be an expert motor car mechanic including starting, lighting, ignition, etc., what school, where located, how long and tuition rate for course?—Philip J. Kenny, New York City.

1—About .004 to .005 at the ends of the rings.

2—The Ford timing gears are marked, so follow the marks. The valve stem clearance should be about .010.

3—It is largely a trick, with snappy action. The right way is to do it with the left hand, avoid a kickback; it is customary to snap the crank up several times to charge the cylinders and then, if it has not started, to spin it, being careful that the spark lever is fully retarded.

4—The best way is to find employment in a good repair shop or garage where repairs are made. There are a number of schools. Any in the following list we recommend: Sweeny's School of Motoring, Kansas City; Iowa State Tractor School; American Bureau of Engineering, Chicago, 1601 Michigan ave.; Michigan State Auto School, Detroit; Greer College of Motoring, 1515 Wabash ave., Chicago.

SALT AS CARBON REMOVER

Q—I recently read an article which stated that if you heat up the engine and then place in each cylinder through the spark plug holes a teaspoonful of table salt that it will remove the carbon from the cylinders. Give your opinion and will this injure the engine?—H. W. Hamilton, Dallas, Tex.

There is not apt to be any destructive action by placing table salt (Na Cl) in a cylinder. There is no chemical affinity between sodium chloride (table salt) and carbon. It is a matter of conjecture as to whether or not the salt will decompose when within the cylinder. On the assumption that decomposition of the salt takes place there is little possibility that either the sodium or the chlorine, the two constituents of table salt, would combine with the carbon for there is present another element, oxygen, which has a greater combining affinity with either sodium or chlorine.

COLE OILING SYSTEM

Q—Explain the oiling system used on 1915 Cole four-cylinder engine.—B. L. Hailes, Pittsburgh, Pa.

This consisted of a conventional gear pump, carrying oil from a sump in the bottom of the crankcase to the oil pans under the connecting rods, thus keeping up a constant level of oil in these pans, the overflow turning back into the crankcase and consequently to the well or sump at the lowest part of the case, generally at the extreme back end.

INSTALLING OIL RING

Q—How should an oil ring be put on an Overland 4? Should the ring be put on with the beveled side toward the bottom of the piston or the top piston?—James O. Coffee, Springfield, Ill.

The bevel edge of the ring should always be toward the top of the piston. The reason is that the bevel portion does not carry the oil with it on the upward stroke, but the bottom portion of the ring which is not bevel scrapes the oil down with it on the intake and explosion strokes, thus tending to overcome oil fouling trouble.

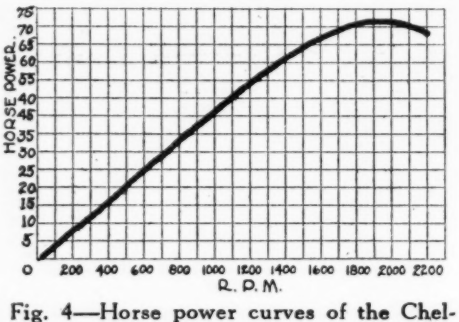


Fig. 4—Horse power curves of the Chelmers Master Six. Chassis model 29, made in 1916

MANY QUERIES ABOUT OVERLAND

Q—What is the normal speed of the Illinois tractor?

2—What is the gear ratio of the Overland 90, 1919?

3—What is the weight of the Overland 90?

4—What is the bore and stroke of the Overland 85-6, 1917?

5—What is the bore and stroke of the latest model Harley-Davidson motorcycle?—Otto Huhn, Kyle, Texas.

1—The normal speed of the Illinois tractor is 800 r.p.m. Four hundred is an error.

2—The gear ratio of the Overland 90 is 3.93 to 1.

3—This car weighs about 2500 lbs.

4—The Overland 85-6 has a bore and stroke of 3¼ in. by 4½ in.

5—The bore and stroke of the Harley-Davidson motorcycle engine is $3\frac{5}{16}$ in. by 3½ in.

ABOUT CONTINENTAL ENGINES

Q—What is a Continental Red Seal engine? Is the 7 W a Red Seal engine? Does the Moon light six use a Continental Red Seal engine?

2—Where can I secure parts for a Halladay car?—Clarence Grove, Divernon Auto Service Co., Divernon, Ill.

1—All Continental engines are the Red Seal engines. As stated by the Continental company, before the war two types of engines were made, a Red Seal and Blue Seal. During the war it became extremely difficult to secure the blue dyes with which to mark the blue seats on the engines, hence the adoption of the Red Seal for all Continental engines. The Moon light six uses a Continental Red Seal engine. Even though the Continental Company makes many different styles of engines they are all Red Seal nevertheless. Types being differentiated by model numbers such as 9 N, 7 R, 7 W, etc.

2—Parts for the Halladay car can be secured from the Barley Manufacturing Company, Kalamazoo, Mich.

CAR BACKFIRES

Q—A 1912 Case car, equipped with a Rayfield carbureter and Remy magneto has been causing trouble. Cylinder No. 1 back fires twice and the engine overheats. The carbon has been cleaned out and the valves ground but it seemed to make little difference. How can this be remedied?

2—Instruct how to make a speedster out of this car.—Genevieve Edwards, Searcy, Ark.

It seems that the trouble with this car is being caused by an incorrectly set spark. This is very often found to be the case when a car has been overhauled and had the valves set. The trouble is that the person setting the ignition timing is apt to too readily accept the first timing that makes the engine run with any regularity. If you will disconnect the rod which controls the advance of the distributer and then

start the engine, you can determine just which position the distributor should be in. With the engine running advance the distributer by hand. This should be advanced until the engine knocks distinctly and loud. Then retard the spark until the knock just disappears. This is the place at which the spark lever should be set so that when it is advanced to its maximum position, this position will be reached.

2—There are so many things that would have to be described in detail in order to furnish complete instructions that we make it a practice of merely suggesting what should be done and leaving the rest to the ingenuity of the builder. First select some suitable car design from the many suggestions that we have published. Then you can decide upon how much of the old body can be used in the new design.

Perhaps the cowl section can be used. Then you will want to build a suitable frame-work upon which the metal is to be placed. Use sheet steel about 20 gage, for this is about as heavy as a sheet as can be successfully bent in metal working machines. The seats should be cushions, thicker than the ordinary car cushion, because they will want to be set directly on the floor. The steering will also have to be lowered.

If it is your desire to increase the speed of the car any considerable amount, then the rear axle ratio should be changed to a higher value.

BADLY FITTED PISTON RINGS

Q—We have in our shop two six-cylinder valve-in-head cars equipped with Stewart vacuum tank and Marvel carbureter, which get gasoline in the crankcase. If six quarts of new oil is put in a car driven 75 to 100 miles, 9 or 10 qt. of oil may be drained out. One car is new and the other has been driven about 4000 miles. Both are equipped with plain step cut rings. The vacuum tanks and carbureters appear to be in good shape. Both cars seem to run and "hit" good but use too much gasoline.

2—When does piston slap show up the plainest, on a slow hard pull or idling? Can it be located by shorting a plug?

3—What is the rated standard horsepower of the Nash?—A. E. Belden, Thorp and Heathman, Warren, Ohio.

1—This is evidently a case where the piston rings are very badly fitted. You say the car is new and it is therefore improbable that score marks large enough to produce such an unheard of dilution are present. Another contributory difficulty is the carbureter, no doubt. To overcome the difficulty, we recommend that you carefully fit some new rings. By carefully fitting new rings, we do not mean to fit the rings on the piston and slip the piston in the cylinder bore. We do mean that the cylinder should first be carefully examined, and that it should be measured and micrometered in at least ten different positions to insure that its over all dimensions are the same in a roe and aft and transverse as well as in positions of different height for the piston. If the bore is found to be round and within .001 of an inch no matter where the measure is taken, then the piston can be fitted with the rings and we feel sure that the trouble will be largely overcome, provided that the carbureter is properly adjusted.

2—Piston slap shows up generally on a hard pull with an advanced spark. Its presence can be determined to a certainty if a rattling, thumping sound is occurring in the engine which disappears when the spark is retarded to its half way position. At this point the spark occurs when the piston has already started its downward stroke and there will be no consequent change in the angularity of the thrust.

3—The Nash engine of 3¼ by 5 in. bore and stroke has a rated horsepower of 25.35.

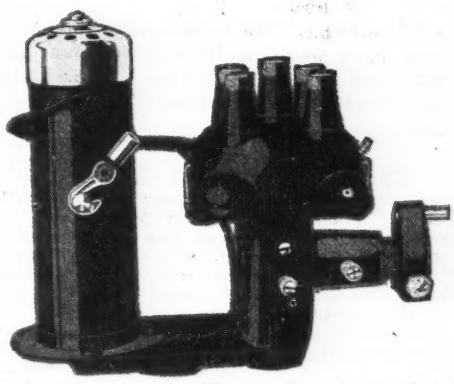


Fig. 6—Atwater-Kent coil and distributer

The Stromberg Carbureter

Setting and Adjusting Two Different Models

CLEANING CARBURETER

Q—Instruct and illustrate how to clean both nozzles on the Stromberg carbureter used on a Liberty Six, Model 10B.

2—Give adjustments.—C. L. Zive, Los Angeles, Calif.

1—To clean the nozzles of the Stromberg unscrew the plugs in the bottom of the carbureter and the nozzles can then be unscrewed and removed easily.

2—Consult Fig. 5. There are three adjustments—high, extremely low or idling and economizing. The high is controlled by the nut A, which locates the position of the needle E, past whose point is taken all the fuel at all speeds. Turning the nut A to the right or clockwise raises the needle E and gives more gasoline; to the left less fuel. Start by putting the economizer pointer L in the fifth notch as an indicator; turn the nut A to the left until the needle E reaches its seat, as shown by nut A not moving when the throttle is opened or closed. When the needle E is in its seat it can be felt to stick slightly when the nut A is lifted with the finger. Find adjustment of A where it just begins to move with the throttle opening, then give twenty-four notches to the right, or

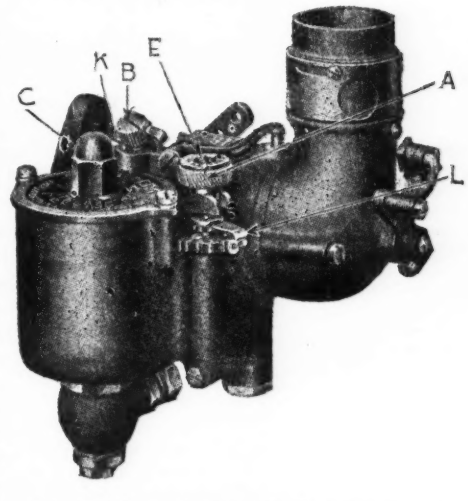


Fig. 5—Stromberg carburetor as used on the Liberty 10-B

ADJUSTMENT ON STROMBERG

Q—Give the correct adjustment on a HNO 2 Stromberg carburetor.

2—What size spray nozzle is used for a C-37 Buick engine?—Anton J. Vavrik, Chicago.

1—Refer to Fig. 7. There are only two adjustments in this type of Stromberg-A, the low speed, which is a needle valve seating in an open nozzle and B, which controls the position of the high speed needle. Permit the engine to run long enough to become warm. The low speed adjustment is turned to the right to weaken the mixture and to the left to enrich it. This operation should be made with the throttle spark half way retarded. Next the high speed adjustment should be turned to the right, or clockwise, as far as it will go. Then open the throttle about one-third and unscrew or turn anti-clockwise the adjustment B until the engine runs smoothly. Try opening the throttle quickly. If the engine does not respond promptly, give more fuel by unscrewing the nut B a few more notches. If with the proper adjustment for about 25 m.p.h. the mixture is too lean at high speeds a higher numbered needle should be used; if too rich a lower numbered, with less taper.

2—A No. 4 needle should be used and

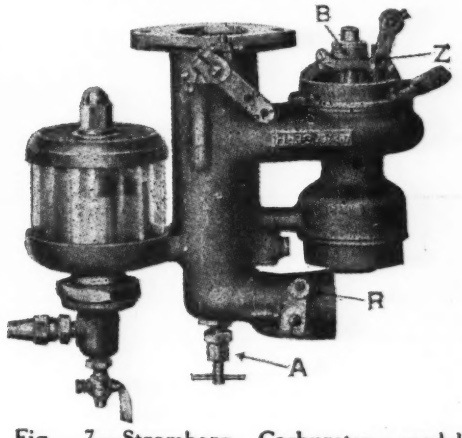


Fig. 7—Stromberg Carbureter model HNO-3, which is similar to the HNO-2 model and the adjustments for the two models are identical.

a 62 nozzle. This is standard, but you may have to do a little experimenting. This one is for the H type; if the G is used then use a 60 nozzle for low speed and a 65 for the high.

USING TOO RICH A MIXTURE

Q—What causes an Essex four to fill with carbon after 700 or 800 miles? I use heavy oil and car has been driven only 5000 miles and is well cared for. Mechanics say there is nothing wrong with the engine but that the fault lies in the driving.

2—When the carbon is cleaned out the car doesn't pull well. In starting up a hill on high speed at five miles an hour, the engine does not pick up well and it is necessary to shift gears often. Should it not be able to pick up to twenty miles an hour?—R. G. Bowman, Shreveport, La.

1—It may be partially due to driving. You can run a car on too rich a mixture—or even too light a mixture—and not obtain good results. It must be remembered also that oil will have much to do with carbon troubles. We are inclined to believe you are using too heavy a grade if you have been in the habit of using the heavy. Carbon accumulates not only by the use of too much oil but by poor carbureter adjustment wherein there is an excess of fuel, which cannot all be burned and must settle somewhere. Perhaps you are in the habit of pulling out the choker and thus permit too rich a mixture. Some drivers have a habit of driving so slowly on high gear that there is no opportunity for the excess gas and oil to be burned and thus carbon will accumulate.

2—This is illogical. But perhaps your carbon removing man does not take the precaution to run some kerosene through the carbureter immediately after the carbon has been removed. If kerosene is not run through the piston and cylinder walls are left so dry as to for a period that there is excess friction, until the lubricating oil can get into thorough circulation. There is not enough acce engine speed at 5 m.p.h. on high to start climbing anything but a very slight grade and it is no wonder the engine does not pick up. A gasoline engine derives its power through rotative speed and that is the reason lower gears are fitted. They should be used, in all fairness to the engine. Remember also that when climbing a hill the mixture should be a trifle richer than when running on the level, because more power is required.

The Electric System

THE BEST SPARK PLUG

Q—Which spark plug will give the best service, one with one sparking point or one with more than one? Garage & Auto Service Co., Michigan City, Ind.

There are as many different opinions on this subject as there are as to which is the better car. Any plug maker can show that his principle is best; yet all will work. The best way is to try the different kinds and then you will not know from mere driving. Experiment proves that a multi-point plug sparks between one of the several terminals and that the other points therefor might just as well be dispensed with. Further, it is extremely difficult to cut all the points accurately.

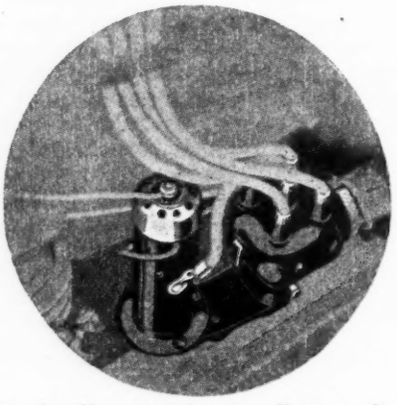


Fig. 9—Showing the installation of the Atwater-Kent Ignition system

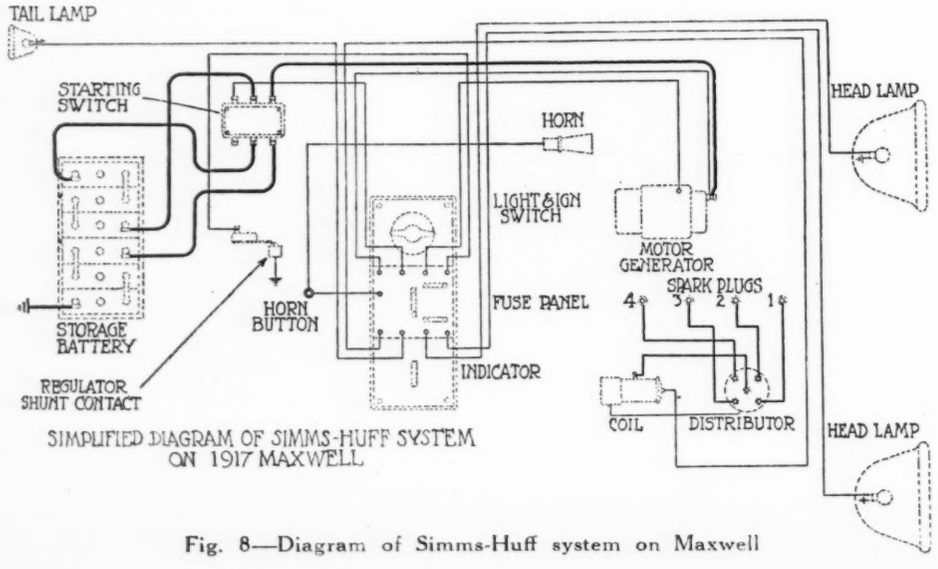


Fig. 8—Diagram of Simms-Huff system on Maxwell

CHANGING IGNITION SYSTEMS

Q—Have a Model E Maxwell, 30 hp., 1910 or 1911 model, not sure which. Same is equipped with Splitdorf magneto and tubular coil. Can this motor be equipped with a Connecticut or Atwater-Kent ignition system? If so, illustrate and explain how it can be done.—F. A. Raabe, Fort Jennings, Ohio.

Yes, this can be easily accomplished by using the type CC instrument, which is for clockwise rotation when looking at the coupling end of the magneto on the Maxwell. This instrument is shown in Fig. 6 and Fig. 9 the way it looks installed. It is easily installed without the use of special tools or fittings, for it bolts directly in place of the magneto and complete instructions come with the instrument. When ordering state the type and model of car and the number of cylinders, as well as mentioning the fact that the magneto drive shaft rotates clockwise.

Miscellaneous

INCREASING TIRE SIZES

Q—It is well known that the use of tires a size larger than the standard equipment of the average car, when properly inflated, decreases the tire cost per mile, increases the ease of riding and saves by better cushioning, particularly the unsprung parts of an automobile. With a 3700-lb. car equipped with 32 by 4½ in. cord tires as standard, if a cord tire could be bought of 33 by 6 in. size, made with slightly heavier walls and the wheels fitted to those rims, would the tire cost per mile show a further increase?

2—Would not the life of the car, and especially the unsprung parts be materially increased?

3—Would the power required to propel the car be merely nominally greater on smooth roads and actually less on rougher roads (the vertical motion of the axles being lessened)?

4—Would there be any injury to the wheel bearings of steering mechanism by reason of the greater weight of the tires?—C. William Hansen, New York, N. Y.

1—The increase in tire cost comes with the increase in size of the section and a 6 in. tire would be so expensive as to be almost prohibitive. Besides, there are no such tire sizes and then a 33 by 6 in. tire would be impractical.

2—We do not think so, because the bigger tire would be so heavy as to materially increase the unsprung weight rather than reduce it. Have you any idea what such a tire would weigh?

3—We are inclined to believe that, under any circumstances, considerably more power would be required, owing to the greater weight of such a tire.

4—Probably not.

PREVENTING RIM RUSTS

Q—Publish best method of keeping rims from rusting and sticking to tires.—F. Swanson, Salerno, Fla.

A good method to prevent the rims from rusting on the tires is to sandpaper the surface of the rim thoroughly and then coat it with a paint made of varnish and lamp black. This forms one of the most durable paints and rust preventatives known. Also its finish is a deep glossy black.

From the Four Winds

Glimpses at the World of Motordom

Coming Motor Events

AUTOMOBILE SHOWS

Chicago	National Automobile Chamber of Commerce	Jan. 24 to 31
Chicago	Automobile Salon	Jan. 24 to 31
Amsterdam, N. Y.	New York State Armory	Jan. 26 to 31
Kansas City	Overland Bldg.	Jan. 31 to Feb. 6
New Brunswick, N. J.	Annual Show	Jan. 31 to Feb. 7
Minneapolis, St. Paul	Minn. Automobile Trade Ass'n	Jan. 31 to Feb. 7
Bridgeport, Conn.	Eighth Annual Show	Feb. 2 to 7
Toledo, O.	Terminal Auditorium	Feb. 2 to 7
Rochester, N. Y.	Rochester Auto Trades Ass'n	Feb. 2 to 7
Baltimore, Md.	Automobile Show	Feb. 3 to 7
Wilmington, Del.	Hotel du'Pont	Feb. 3 to 8
Peoria, Ill.	Automobile Dealers' & Acc. Ass'n	Feb. 4 to 7
Charlotte, N. C.	Charlotte Automobile Trade Ass'n	Feb. 9 to 14
Greenfield, Mass.	Mass. State Armory	Feb. 9 to 14
New Haven, Conn.	Automobile Dealers' Ass'n	Feb. 9 to 14
Nashville, Tenn.	Automobile Show	Feb. 9 to 14
Salt Lake City	Automobile Show	Feb. 9 to 14
Cedar Rapids, Iowa	Automobile Show	Feb. 9 to 14
Deadwood, S. D.	Deadwood Business Club	February
Council Bluffs, Ia.	Automobile Dealers' Ass'n	Feb. 10 to 14
Quincy, Ill.	Automobile Show	Feb. 10 to 15
Evansville, Ind.	Evansville Dealers' Ass'n	Feb. 11 to 14
Albany, N. Y.	Automobile Show	Feb. 14 to 21
Brooklyn, N. Y.	Motor Vehicle Dealers' Ass'n	Feb. 14 to 21
Detroit, Mich.	Detroit Automobile Dealers' Ass'n	Feb. 14 to 21
San Antonio, Tex.	Automobile Show	Feb. 14 to 22
Des Moines, Ia.	Herring Motor Co.	Feb. 16 to 21
Manchester, N. H.	Automobile Show, Academy	Feb. 16 to 20
St. Louis	St. Louis Automobile Mfrs. & Dealers' Ass'n	Feb. 16 to 21
New Haven, Conn.	Automobile Show	Feb. 16 to 21
Indianapolis, Ind.	Automobile Show	Feb. 22 to 28
Duluth, Minn.	Automobile Show	Feb. 23 to 28
Waterloo, Iowa	First Annual Show	Feb. 21 to 26
San Francisco	San Francisco Motor Car Dealers' Ass'n	Feb. 21 to 28
Ottawa, Canada	Motor Show	Feb. 21 to 28
Bethlehem, Pa.	Sixth Annual Show	Feb. 23 to 28
Louisville, Ky.	Louisville Automobile Dealers' Ass'n	Feb. 23 to 28
Pittsfield, Mass.	Mass. State Armory	Feb. 23 to 28
St. Joseph, Mo.	St. Joseph Automobile Dealers' Ass'n	March 1 to 6
Portland, Ore.	Portland Automobile Trade Ass'n	Feb. 23 to 28
Grand Rapids, Mich.	Automobile Show	Feb. 23 to 28
Wichita, Kans.	Automobile Show	Feb. 23 to 30
Columbus, Ohio	Memorial Hall	Feb. 24 to 28
Fort Dodge, Ia.	Automobile Dealers' Ass'n	Feb. 24 to 28
Newark, N. J.	First Regiment Armory	Feb. 28 to March 6
Omaha, Nebr.	Automobile Show	March 1 to 6
Scranton, Pa.	Automobile Show	March 1 to 6
Buffalo, N. Y.	Buffalo Automobile Dealers' Ass'n	March 1 to 6
Portland, Maine	Portland Automobile Dealers' Ass'n	March 1 to 6
Perth Amboy, N. J.	First Automobile Show	March 1 to 6
Lyons	Automobile Show	March 1 to 8
Springfield, Mass.	Springfield Automotive Dealers' Ass'n	March 1 to 7
Syracuse, N. Y.	Syracuse Automobile Dealers' Ass'n	March 1 to 6
Seattle, Wash.	Seattle Automobile Show	March 1 to 6
Denver	Denver Automobile Trade Ass'n	March 2 to 6
Clinton, Iowa	Clinton Automobile Dealers' Ass'n	March 3 to 6
Quincy, Ill.	Quincy Automobile Dealers' Ass'n	March
Lancaster, Pa.	Automobile Show	March 3 to 6
Indianapolis, Ind.	Automobile Show	March 8 to 13
Jersey City, N. J.	Automobile Show	March
Boston, Mass.	Mechanics' Bldg	March 13 to 20
New Orleans	Automobile Show	March
Oklahoma City, Okla.	Oklahoma City Dealers' Ass'n	March 15
Little Rock, Ark.	Liberty Hall	March 15
Great Falls, Mont.	Automobile Show	March 15 to 22
Wilkes-Barre, Pa.	Passenger Car & Truck Show	March 15 to 22
Albany, Ala.	Automobile Show	April 6 to 10

TRUCK SHOWS

Chicago	National Automobile Chamber of Commerce	Jan. 24 to 31
Peoria, Ill.	Automobile Dealers' & Acc. Ass'n	Feb. 9 to 10
New Haven, Conn.	Automobile Dealers' Ass'n	Feb. 16 to 21

TRACTOR SHOWS

Wichita, Kan.	Wichita Thresher-Tractor Club	Feb. 9 to 14
Kansas City, Mo.	Kansas City Tractor Club	Feb. 16 to 21

MISCELLANEOUS CONVENTIONS AND MEETINGS

Louisville, Ky.	Seventeenth Annual Convention American Road Builders' Ass'n; Tenth American Good Roads Congress and Eleventh National Good Roads Show	Feb. 9 to 13
Lake Charles, La.	Louisiana-Mississippi Automotive Trade Ass'n Convention	March 17 to 18

A New Way to Check Gasoline Sales—Checking up gasoline, provided it can be done with any reasonable amount of accuracy is prolific of results oftentimes bordering on the startling. Russell P. Taber, Inc., Hartford, Conn., recently attached a simple little white paper tape device, that measures and checks up all the gasoline drawn. As the pump handle is raised the tape begins to travel. It continues to travel while the pump is working. The tape is subdivided to indicate quarts and half-gallons. Even the smallest amount drawn by the pump is bound to be indicated on the tape. The man who pumps the gas must endorse the slip. The idea has worked out very nicely indeed.

Cafe Now Accessory Business—One of Hartford's best conducted cafes has bowed to the inevitable and become an accessory establishment. Joseph E. Hirth, formerly in the liquor trade with his father, conducted one of those rare places that existed quietly and peacefully, so peacefully in fact as to never suggest the actual business of the firm. When prohibition actually showed up, Mr. Hirth discontinued business on July 1. He has utilized the costly fixtures of the former business for accessory display. The result is that the new store is one of the neatest in town and while the embellishment can hardly be termed ornate, yet it is dignified to a most pleasing degree. And those who formerly polished the brass rail now pass their accessory business along to Joe Hirth.

Wants Fire Equipment Motorized—Safety Director John P. McCune has recommended to the city council that all of the steam fire engines in the Columbus, Ohio, fire department be abandoned for gasoline pumping apparatus. At present some of the engine houses are equipped with tractors to haul the old steam pumpers. Because of the shortage of men and higher cost of operation, the recommendation is made. An ordinance was introduced in the city council to authorize the issuance of $110,000 bonds to provide for the change.

St. Louis Increases Car Production—In its review of St. Louis business for 1919, Greater St. Louis, the official bulletin of the St. Louis Chamber of Commerce, the following is given to motor cars:

"Robert E. Lee, editor of the Auto Review, places the total number of cars and trucks manufactured in St. Louis in 1919 at 21,600. This output was divided as follows: 3,500 Dorris, $13,125,000; 10,000 traffic trucks, $13,950,000; 8,000 Moon cars, $16,000,000; 100 miscellaneous cars, $300,000.

Columbus (Ohio), Thefts Increase—Police records in Columbus show that approximately 550 cars were stolen in the city during 1919. This is 100 more than were stolen in 1918. Of the cars taken in 1919, 177 were never recovered. In 1918, only 93 of the 450 cars stolen were not recovered. Estimates given on the unrecovered stolen cars in 1919 show a valuation of $170,472.

1920 Directory of Passenger Car Makers

Name of Car.	Manufacturer and Address.
Allen	Allen Motor Car Co., Fostoria, Ohio.
American	American Motor Corp., Plainfield, N. J.
American Beauty	Pan Am. Motors Corp., Decatur, Ill.
Anderson	Anderson Motors Co., Rock Hill, S. C.
Apperson	Apperson Bros. Co., Kokomo, Ind.
Argonne	Jersey City Machine Co., Jersey City, N. J.
Auburn	Auburn Automobile Co., Auburn, Ind.
Beggs	Beggs Motor Car Co., Kansas City, Mo.
Bell	Bell Motor Car Co., York, Pa.
Biddle	Biddle Motor Car Co., Philadelphia, Pa.
Brewster	Brewster & Co., Long Island City, N. Y.
Briscoe	Briscoe Motor Co., Jackson, Mich.
Buick	Buick Motor Co., Flint, Mich.
Bour-Davis	Louisiana Motor Car Co., Shreveport, La.
Cadillac	Cadillac Motor Car Co., Detroit, Mich.
Cameron	Cameron Motors Corp., New York, N. Y.
Case	J. I. Case E. M. Co., Racine, Wis.
Chalmers	Chalmers Motor Co., Detroit, Mich.
Champion	Direct Drive Motor Co., Philadelphia, Pa.
Chandler	Chandler Motor Car Co., Cleveland, O.
Chevrolet	Chevrolet Motor Co., Flint, Mich.
Cleveland	Cleveland Automobile Co., Cleveland, O.
Climber	Climber Motor Corp., Little Rock, Ark.
Cole	Cole Motor Car Co., Indianapolis, Ind.
Columbia	Columbia Motors Co., Detroit, Mich.
Comet	Comet Automobile Co., Decatur, Ill.
Commonwealth	Commonwealth Motors Co., Chicago, Ill.
Crawford	Crawford Auto Co., Hagerstown, Md.
Crow-Elkhart	Crow-Elkhart Motor Co., Elkhart, Ind.
Cunningham	James Cunningham & Sons, Rochester, N. Y.
Daniels	Daniels Motor Car Co., Reading, Pa.
Davis	Geo. W. Davis Car Co., Richmond, Pa.
Dodge Brothers	Dodge Brothers, Detroit, Mich.
Dort	Dort Motor Car Co., Lansing, Mich.
Dorris	Dorris Motor Car Co., St. Louis, Mo.
Dupont	Du Pont Motor Mfg. Corp., Wilmington, Del.
Dixie Flyer	Ky. Wagon Mfg. Co., Louisville, Ky.
Elgin	Elgin Motor Car Co., Argo, Ill.
Elcar	Elkhart Motor Car Co., Elkhart, Ind.
Essex	Essex Motors Co., Detroit, Mich.
Ferris	Ohio Motor Vehicle Co., Cleveland, O.
Fiat	Fiat Company, Poughkeepsie, N. Y.
Franklin	Franklin Mfg. Co., Syracuse, N. Y.
Ford	Ford Motor Car Co., Detroit, Mich.
Gardner	Gardner Motor Co., St. Louis, Mo.
Geronimo	Geronimo Motor Car Co., Enid, Okla.
Grant	Grant Motor Car Co., Cleveland, Ohio.
Hatfield	Cortland Cart & Carriage Co., Sydney, N. Y.
Hanson	Hanson Motor Co., Atlanta, Ga.
Harroun	Harroun Motors Co., Detroit, Mich.
Harvard	Harvard Motor Car Co., Troy, N. Y.
Haynes	Haynes Automobile Co., Canton, Ohio.
H. C. S.	H. C. S. Motor Car Co., Indianapolis, Ind.
Hollier	Lewis Spring & Axle Co., Chelsea, Mich.
Holmes	Holmes Automobile Co., Canton, Ohio.
Hudson	Hudson Motor Car Co., Detroit, Mich.
Huffman	Huffman Bros. Motor Co., Elkhart, Ind.
Hupmobile	Hupp Motor Co., Detroit, Mich.
Jackson	Jackson Motors Corp., Jackson, Mich.
Jones	Jones Motor Car Co., Wichita, Kan.
Jordan	Jordan Motor Car Co., Cleveland, Ohio.
King	King Motor Car Co., Detroit, Mich.
Kissel	Kissel Motor Car Co., Hartford, Wis.
Klinekar	Kline Motor Car Corp., Richmond, Va.
LaFayette	La Fayette Motors Co., Indianapolis, Ind.
Leach-Biltwell	Leach-Biltwell Motor Co., Los Angeles, Cal.
Lenox	Lenox Motor Car Co., Boston, Mass.
Lexington	Lexington Motor Co., Connersville, Ind.
Liberty	Liberty Motor Car Co., Detroit, Mich.
Lincoln	Lincoln Motor Co., Detroit, Mich.
Locomobile	Locomobile Co. of Amer., Bridgeport, Conn.
Lorraine	Lorraine Motors Corp., Grand Rapids, Mich.
Maibohm	Maibohm Motors Co., Sandusky, Ohio.
Marmon	Nordyke & Marmon Co., Indianapolis, Ind.
Marshall	Marshall Mfg. Co., Chicago, Ill.
Martin-Wasp	Martin-Wasp Corp., Bennington, Vt.
Maxwell	Maxwell Motor Co., Detroit, Mich.
McFarlan	McFarlan Motor Co., Connersville, Ind.
Mercer	Mercer Auto Co., Trenton, N. Y.
Metz	Metz Co., Waltham, Mass.
Mitchell	Mitchell Motors Co., Racine, Wis.
Monitor	Monitor Motor Car Co., Columbus, Ohio.
Moon	Moon Motor Car Co., St. Louis, Mo.
Moore	Moore Motor Co., Danville, Ill.
Monroe	Wm. Small Co., Indianapolis, Ind.
Murray	Murray Motor Car Co., Pittsburgh.
Nash	Nash Motors Co., Kansas City, Mo.
National	National Motor Car & Vehicle Co., Indianapolis, Ind.
Nelson	Nelson Motor Car Co., Detroit, Mich.
Oakland	Oakland Motor Car Co., Pontiac, Mich.
Ogren	Ogren Motor Car Co., Milwaukee, Wis.
Oldsmobile	Olds Motor Works, Lansing, Mich.
Olympian	Olympian Motors Co., Pontiac, Mich.
Overland	Willys-Overland Co., Toledo, Ohio
Owen	International Fabricating Co., Wilkes-Barre, Pa.
Packard	Packard Motor Car Co., Detroit, Mich.
Paige	Paige Motor Car Co., Detroit, Mich.
Paterson	Paterson Co., W. A., Flint, Mich.
Peerless	Peerless Motor Car Co., Cleveland, Ohio
Phianna	M. H. Carpenter, Long Island City, N. Y.
Piedmont	Piedmont Motor Car Co., Lynchburg, Va.
Pierce-Arrow	Pierce-Arrow Motor Car Co., Buffalo, N. Y.
Pilot	Pilot Motor Car Co., Richmond, Ind.
Porter	American & British Corp., Bridgeport, Conn.
Premier	Premier Car Corp., Indianapolis, Ind.
Reo	Reo Motor Car Co., Lansing, Mich.
Re Vere	Revere Motor Car Co., Logansport, Ind.
Roamer	Barley Motor Car Co., Kalamazoo, Mich.
R & V Knight	Root & Van Dervoort Eng. Co., Moline, Ill.
Saxon	Saxon Motor Car Corp., Detroit, Mich.
Sayers	Sayers-Scoville Co., Cincinnati, Ohio
Scripps-Booth	Scripps-Booth Co., Detroit, Mich.
Seneca	Seneca Motor Car Co., Fostoria, Ohio
Skelton	Skelton Motor Corp., St. Louis, Mo.
Singer	Singer Motor Co., Long Island City, N. Y.
Standard	Standard Steel Car Co., Pittsburgh, Pa.
Stevens-Duryea	Stevens Duryea Co., Chicopee Falls, Mass.
Stephens	Stephens Motor Branch, Moline Plow Co., Freeport, Ill.
Studebaker	Studebaker Corp., South Bend, Ind.
Stutz	Stutz Motor Car Co., Indianapolis, Ind.
Templar	Templar Motors Corp., Cleveland, Ohio
Velie	Velie Motors Corp., Moline, Ill.
Westcott	Westcott Motor Co., Springfield, Ohio
Willys-Knight	Willys-Overland Co. Toledo, Ohio.
Winther	Winther Motor Sales Corp., Kenosha, Wis.
Winton	Winton Co., Cleveland, Ohio

Buyer's Guide to Car Body Styles

The prices given herewith are the latest list prices but are subject to change. The illustrations of the bodies that are listed here are to be found in the section beginning with page 59. Owing to conditions in the industry it has been impossible this year to get this data together in time to list the page number after the body style. The N.A.C.C. horsepower rating is used under "HP."

Seven-Passenger Touring Cars

NAME AND MODEL	PRICE	CYL.	HP.	W.B.	TIRES
Anderson, A	.....	6	25.35	120	33x4
Apperson Anniversary	$4000	8	33.80	130	34x4½
Apperson, 8-20	2950	8	33.80	130	34x4½
Buick	.....	6	27.34	124	34x4½
Cadillac, 57	.....	8	31.25	125	35x5
Case, V	2400	6	29.40	126	34x4½
Chandler	1895	6	29.40	123	33x4
Cole Aero Eight Tourster, 870	2850	8	39.20	127	33x5
Cunningham, V-3	.....	8	45.00	132	35x5
Daniels, D	.....	8	39.20	132	34x4½
Davis	.....	....	.....	.....	.....
Davis	.....	....	.....	.....	.....
Dorris, 6-80	4350	7	38.40	132	33x5
Geronimo	.....	....	.....	.....	.....
Haynes, 45	.....	6	29.40	127	34x4½
Haynes, 46	.....	12	36.30	127	34x4½
Holmes	3100	6	29.40	126	34x4½
Hudson, O	2200	6	29.40	125	34x4½
Jones, 28-B	2250	6	29.40	126	34x4
Jordan, F	2775	6	29.40	127	32x4½
King, H	2585	8	28.80	120	32x4½
Kissel, Custom Built	2975	6	26.75	124	32x4½
Klinekar, 6-55-J	1990	6	25.35	121	33x4
Locomobile	.....	....	.....	.....	.....
Locomobile	8100	....	.....	.....	.....
Marmon, 34	4650	6	33.75	136	32x4½
McFarlan	.....	....	.....	.....	.....
Moon, 6-68	.....	6	29.40	122	32x4
Nash	.....	....	.....	.....	.....
National Sextet, BB	3500	6	29.40	130	32x4½
Oldsmobile, 45-B	2045	8	26.45	120	33x4½
Packard, 3-35	.....	12	43.20	136	35x5
Paige	.....	....	.....	.....	.....
Paterson, 6-47	1725	6	25.35	120	33x4
Peerless, 56	2900	8	33.80	125	34x4
Pierce-Arrow, 31	7250	....	.....	.....	.....
Pierce-Arrow, 51	7750	....	.....	.....	.....
Porter, 45	9400	4	33.85	142	35x5
Premier, 6-D	4300	6	27.34	126¾	32x4½
Roamer, 6-54	3075	6	29.40	128¼	32x4½
R & V Knight, J	3150	6	29.40	127	32x4½
Singer	.....	....	.....	.....	.....
Standard, 1	.....	8	33.80	127	34x4½
Stanley, 735-B	4275	....	.....	130	.....
Studebaker, E-G	2250	6	36.04	126	33x4½
Stutz	3350	4	30.63	130	32x4½
Westcott, C-48	2890	6	29.40	125	23x4½
Willys-Knight	.....	....	.....	.....	.....
Stearns-Knight, SKL-4	2575	4	22.50	125	34x4½
Porter, 45	.....	4	.....	142	35x5

Six-Passenger Touring Cars

NAME AND MODEL	PRICE	CYL.	HP.	W.B.	TIRES
Biddle, B	$3950	4	22.50	121	32x4
Cunningham, V-3	On app.	8	45.00	132	35x5
Daniels	.....	8	39.20	132	34x4½
Ferris, phaeton	3390	6	29.40	130	32x4½
Klinekar, 6-55-J	1990	6	25.35	121	33x4
Mercer	4950	4	22.50	132	32x4½
Ogren, 6-60	3250	6	79.35	134	33x5
Pierce-Arrow, 51	7750	....	.....	.....	.....
Stephens	2050	6	25.35	122	33x4½

Five-Passenger Touring Cars

NAME AND MODEL	PRICE	CYL.	HP.	W.B.	TIRES
Allen, 43	$1495	4	19.60	110	32x4
American	1865	6	23.44	122	32x4
Amer. Beauty, E-6-48	2150	6	25.35	121	33x4
Anderson, Series 30	.....	6	25.35	120	.....
Auburn, 6-39	1795	6	29.40	120	33x4
Beggs Six	1630	6	25.35	120	33x4
Bell	1395	4	22.50	114	31x4
Bour-Davis, 20	1750	6	25.35	118	32x4
Brewster, 91	8100	....	.....	.....	.....
Briscoe, 4-34	.....	4	18.23	109	31x4
Buick	.....	6	27.34	118	34x4½
Cameron, 55	2000	6	20.65	118	32x4
Chalmers, 35-C	1685	6	25.35	117	32x4
Champion, C-4	1250	4	19.60	116	32x3½
Champion, S-4	1395	4	19.60	118	32x4
Chevrolet, 4-90	735	4	21.76	102	31x4
Chevrolet, FB	1235	4	21.76	110	33x4
Cleveland, 40	1385	6	21.60	112	32x4
Climber, 4-40	1465	4	16.90	112	33x4
Columbia, C	1795	6	25.35	115	32x4
Comet, C-53	2150	6	29.40	125	33x4½
Commonwealth, 4-40	1395	4	19.60	117	32x4
Crow-Elkhart, L-55	1295	4	23.44	116	33x4
Crow-Elkhart, H-55	1545	6	19.60	115	32x3½

Five-Passenger Touring Cars—Continued.

Davis, 51	1985	6	25.35	120	33x4
Dixie Flyer, HS-60	1465	4	16.90	112	32x4
Dodge Brothers	.....	4	24.03	114	32x3½
Dort, 15	985	4	19.60	105½	30x3½
duPont, A	.....	4	24.75	124	32x4½
Economy, 6-46	1795	6	25.35	115	33x4
Elcar, D-4	1395	4	19.60	116	33x4
Elcar, D-6	1595	6	25.35	116	33x4
Elgin, K	1665	6	23.44	118	33x4
Essex, A	1495	4	18.23	108½	32x4
Ford, T	525	4	22.50	100	30x3½
Franklin, 9-B	2750	6	25.35	115	32x4
Gardner, G	1125	4	19.60	112	32x3½
Geronimo	1550	6	23.44	122	32x4
Grant	.....	6	22.52	116	32x4
Hanson, 54	2165	6	25.35	119	32x4
Harroun, A-A-2	995	4	16.90	106	30x3½
Hatfield, A-42	1695	4	16.90	115	32x4
H. C. S. Special	.....	4	21.03	120	32x4½
Hollier, 206-B	1985	6	25.35	120	32x4
Huffman, W	1795	6	25.35	120	32x4
Hupmobile, R-3	1950	4	16.90	112	32x4
Jackson, 6-38	1885	6	25.35	121	33x4
Jones, 28-B	2250	6	29.40	126	34x4
Jordan, M	2550	6	25.35	120	32x4
Klinekar, 6-55-J	1965	6	25.35	121	33x4
Leach	4300	6	29.40	126½	32x4½
Lexington, S	1885	6	25.35	122	32x4
Liberty, 10-C	1695	6	23.44	117	32x4
Lorraine, 20	1425	4	19.60	114	32x4
Maibohm, B	1395	6	23.44	116	32x4
Marshall, K	1295	4	19.60	118	32x3½
Maxwell, 25	985	4	21.03	109	30x3½
Metz Master 6	1895	6	23.44	120	32x4
Mitchell, E-40	1750	6	25.35	120	33x4
Monitor, M & O	1575	6	25.35	117	.....
Monroe, S-9	1440	4	16.90	115	32x3½
Moon, 6-48	1095	6	25.35	122	32x4
Moore, F	1095	6	25.35	108	30x3½
Nash, 681	.....	6	25.35	121	33x4
Nelson, D	1700	4	15.63	104	32x4
Oakland, 34-C	1165	6	18.99	115	32x4
Oldsmobile, 37-A	1395	6	18.99	112	32x4
Overland, 4	945	4	18.23	100	30x3½
Packard, 3-35	.....	12	43.20	136	35x5
Paige, 6-42	1595	6	23.44	119	32x4
Paige, 6-55	.....	....	.....	.....	.....
Paterson, 6-47	1695	....	.....	.....	.....
Piedmont, 4-30	1395	4	19.60	116	32x3½
Piedmont, 6-40	1865	6	25.35	122	32x4
Pierce-Arrow, 31	7250	....	.....	.....	.....
Pierce-Arrow, 51	7650	....	.....	.....	.....
Pilot, 6-45	1650	6	23.44	120	32x4
Reo, T-6	1650	6	24.30	120	33x4
ReVere, C, D & E	4250	....	.....	.....	.....
R & V Knight, R	2150	4	22.50	115	32x4
Saxon	1785	....	.....	.....	.....
Sayers	1745	6	25.35	118	33x4
Scripps-Booth, B-39	1425	6	18.99	115	32x4
Seneca, L	1185	4	15.63	108	30x3½
Singer	5800	....	.....	.....	.....
Skelton, 35-T	1245	4	19.60	112	32x3½
Stanley, 735	4275	....	.....	130	.....
Stearns, SKL-4	2350	4	22.50	125	34x4½
Stevens-Duryea	.....	....	.....	.....	.....
Studebaker, E-H	1785	6	29.40	119	32x4
Studebaker	.....	....	.....	.....	.....
Stutz, H	3350	4	30.63	130	32x4½
Templar, A-445	2685	4	18.23	118	32x4
Tulsa, E-1	1335	4	19.60	117½	33x4
Velie, 48	1785	6	25.35	115	32x4
Velie, 34	1485	6	23.44	112	32x3½
Westcott, C-38	2390	6	25.35	118	33x4
Westcott, C-48	2890	6	29.40	125	23x4½
Winther, 61	.....	6	25.35	119½	33x4

Four-Passenger Touring Cars

NAME AND MODEL	PRICE	CYL.	HP.	W.B.	TIRES
Argonne, A	$4750	4	22.50	128	32x4
Apperson, 8-20 Sportster	2950	8	33.80	130	34x4½
Apper. Anniversary, Tr.	4000	8	33.80	130	34x4½
Anderson, G	.....	6	25.35	120	33x4
Auburn, Tourster	1695	6	25.35	120	33x4
Biddle, B	3750	4	22.50	121	32x4
Cadillac, 57, Phaeton	.....	8	31.25	125	35x5
Columbia, Sport	1945	6	25.35	115	32x4
Cunningham, V-3	.....	8	45.00	132	35x5
Davis, 51	.....	6	25.35	120	33x4
Dorris, S-80	4350	6	38.40	132	35x5
Davis, 51	2025	6	25.35	120	33x4
Elcar	1395	4	19.60	116	33x4

Buyer's Guide to Body Styles—Continued

Four-Passenger Touring Cars—Continued

Elcar	1595	6	25.35	116	33x4
Elgin, K, Victory Scout	1785	6	23.44	118	33x4
duPont, A	4000	4	24.75	124	32x4½
H. C. S.	.....	---	21.03	120	32x4½
Hudson, O, Phaeton	2200	6	29.40	125½	34x4½
Jordan, F	2775	6	29.40	127	32x4½
King, H, Foursome	2585	8	28.80	120	32x4½
Kissel, Custom Built	2975	6	26.75	124	32x4½
Klinekar, 6-55-J, Sport	1965	6	25.35	121	33x4
Lexington, S	1985	6	25.35	120	32x4
Liberty, 10-C	1785	6	23.44	117	32x4
Locomobile, 48	8200	6	48.60	142	35x5
Marmon, 34	4650	6	33.75	136	32x4½
Mercer, Series 5	4950	4	22.50	132	32x4½
Meteor, K R	5000	4	25.60	129	32x4½
Nash, 687	.....	6	25.35	121	33x4
Natl. BB Sextet, Phaeton	3500	6	29.40	130	32x4½
Oldsmobile, 45-B	2045	8	26.45	120	33x4½
Owen-Magnetic	.....	6	38.40	142	35x5
Pierce-Arrow, 38	7250	6	38.40	134	34x4½
Pierce-Arrow, 48	7650	6	48.60	142	35x5
Phianna	9000	4	24.70	125	32x4½
Premier, 6-D	4300	6	27.34	126¾	32x4½
ReVere, C, D & E	4250	4	30.63	131	32x4½
Roamer, 6-54	2850	6	29.40	128¼	32x4½
R & V Knight, J	3150	6	29.40	127	32x4½
Singer	5800	12	39.68	108	33x5
Standard, I	.....	8	33.80	127	34x4½
Stearns-Knight Militaire	2375	4	22.50	125	34x4½
Stephens, 80	2050	6	25.35	122	33x4½
Velie, 48, Sport	1950	6	25.35	122	32x4

Four-Passenger Roadsters

NAME AND MODEL	PRICE	CYL.	HP.	W.B.	TIRES
Brewster, Runabout	$7900	4	25.60	125	34x4½
Case, Sport	2400	6	29.40	126	34x4½
Champion	1250	4	19.60	116	32x3½
Chandler, Dispatch	1975	6	29.40	123	33x4
Chandler	1895	6	29.40	123	33x4
Cole, 872	2850	8	39.20	127	33x5
Crow-Elkhart, L-54	1445	4	19.60	117	32x3½
Crow-Elkhart, H-54	1695	6	23.44	117	33x4
Cunningham, V-3	On app.	8	45.00	142	35x5
Davis, 51	2150	6	25.35	120	33x4
Economy, 6-46	1795	6	25.35	115	33x4
Elgin, Victory Scout	1585	6	23.44	118	33x4
Franklin, 9-B	2750	6	25.35	115	32x4
Hatfield	.....	4	16.90	115	32x4
Haynes, 45	2685	6	29.40	127	34x4½
Haynes, 46	3450	12	36.30	127	34x4½
Holmes	3050	6	29.40	126	34x4½
Jackson, 6-38	2500	6	25.35	121	33x4
Jones, 28	2250	6	29.40	126	34x4
King, H, Foursome	2585	8	28.80	120	32x4½
Locomobile, Dbl. Cowl	9600	6	48.60	142	35x5
Marmon, 34	4650	6	33.75	136	32x4½
McFarlan	.....	6	48.60	136	35x5
Mercer, Series 5	.....	4	22.50	132	32x4½
Noma, 1-B	.....	6	25.35	128	32x4½
Ogren, 6-60	3250	6	33.75	134	33x5
Oldsmobile, 37-A	1395	6	18.99	112	32x4
Packard, 3-35, Runabout	.....	12	43.20	136	35x5
Paterson, 6-47	.....	6	25.35	120	33x4
Peerless, 56	2900	8	33.80	125	34x4½
Pierce-Arrow, 38	7250	6	38.40	134	34x4½
Pierce-Arrow, 48	7650	6	48.60	142	35x5
Pilot, 6-45	1700	6	23.44	120	32x4
Roamer, 6-54	2975	6	29.40	128¼	32x4½
Singer	5700	12	39.68	108	33x5
Studebaker, E H	1785	6	29.40	119	32x4

Three-Passenger Roadsters

NAME AND MODEL	PRICE	CYL.	HP.	W.B.	TIRES
Allen, 43	$1495	4	19.60	110	32x4
American	1895	---	.....	.....	.....
Argonne	4750	4	22.50	118	32x4
Biddle, B	3750	4	22.50	121	32x4
Buick	.....	6	27.34	118	34x4½
Cleveland, 40	1385	6	21.60	112	32x4
Crow-Elkhart, L-53	1295	4	19.60	117	32x3½
Crow-Elkhart, H-53	1545	6	23.44	117	33x4
Gardner, G	1125	4	19.60	112	32x3½
Grant, H-X	1595	6	22.52	116	32x4
Klinekar, 6-55-J	1965	6	25.35	121	33x4
Mitchell, F-40	1750	6	25.35	120	33x4
Pierce-Arrow, 38, Run	7250	6	38.40	134	34x4½
Pierce-Arrow, 48, Run	7650	6	48.60	142	.....
Reo, T-6	.....	6	24.30	120	33x4
Scripps-Booth, B	1425	6	18.99	115	32x4
Singer, 20	5700	12	39.68	138	33x5
Stearns, SKL-4	2350	4	22.50	125	34x4½
Studebaker, E J Landau Roadster	1685	6	23.44	112	32x4
Tulsa, E	1335	4	19.60	117½	33x4
Winton, 25	4250	6	33.75	132	35x5

Two-Passenger Roadsters

NAME AND MODEL	PRICE	CYL.	HP.	W.B.	TIRES
American Beauty	$2150	6	25.35	121	33x4
Apperson, 8-20, Ace	2950	8	33.80	130	34x4½
Auburn, 6-39	1695	6	25.35	120	33x4
Biddle, B, Speedway Sp	3750	4	22.50	121	32x4

Two-Passenger Roadsters—Continued

Briscoe, 4-34	1285	4	18.23	109	31x4
Cadillac, 57	.....	8	23.44	125	35x5
Chalmers, 35-C	1795	6	25.35	117	32x4
Chevrolet, 490	.....	4	21.70	102	31x4
Chevrolet, F B	.....	4	21.70	110	33x4
Cole, 871	2850	8	39.20	127	33x5
Columbia	1945	6	25.35	115	32x4
Cunningham, V-3	On app.	8	45.00	132	35x5
Daniels, D-19	.....	8	39.20	132	34x4½
Dixie Flyer, H-S-50	1465	4	16.90	112	32x4
Dodge Brothers	.....	4	24.03	114	32x3½
Dort, 15	985	4	19.60	105½	30x3½
duPont, A	4000	4	24.75	124	32x4½
Essex, A	1495	4	18.23	108½	32x4
Ford, T, Runabout	500	4	22.50	100	30x3½
Franklin, 9-B, Runabout	2700	6	25.35	115	32x4
Hanson, 54	2165	6	25.35	119	32x4
Huffman, W	1795	6	25.35	120	32x4
Hupmobile, R-3	.....	4	16.90	112	32x4
Jones, 28	2250	6	29.40	126	34x4
Jordan, M	2550	6	25.35	120	32x4
Jordan, F	2550	6	29.40	127	32x4½
King, H, Road King	2600	8	28.80	120	32x4½
Kissel, Custom Built	2975	6	26.75	124	32x4½
KlineKar, 6-55-J	1965	6	25.35	121	33x4
Liberty, 10-C	1695	6	23.44	117	32x4
Marshall, K	1295	4	19.60	118	32x3½
Maxwell, 25	.....	4	21.03	109	30x3½
McFarlan	4800	6	48.60	136	35x5
Mercer, Ser. 5, Raceabt	4675	4	22.50	115	32x4½
Meteor	4850	4	25.60	129	32x4½
Metz, Master Six	1895	6	23.44	120	32x4
Mitchell, F-40	1750	6	25.35	120	33x4
Monroe, S	1440	4	16.90	115	32x3½
Nash, 686	.....	6	25.35	121	33x4
National, BB Sextet	3500	6	29.40	130	32x4½
Noma, 1-B	2800	6	25.35	128	32x4½
Oakland, 34-C	1165	6	18.97	115	32x4
Ogren, 6-75	3250	6	33.75	134	33x5
Overland, 4	945	4	18.23	100	30x3½
Porter, 45	9200	4	33.85	142	35x5
Premier, 6-D	4300	6	27.34	126¾	32x4½
ReVere, C, D & E	4250	4	30.63	131	32x4½
Roamer, 6-54	2950	6	29.40	128	32x4
R & V Knight, J	3150	6	29.40	127	32x4½
Singer, 20	5700	12	39.68	138	33x5
Skelton, 35-T	1245	4	19.60	.....	32x3½
Spacke, S-20	295	2	9.8	90	28x3
Standard, I	.....	8	33.80	127	34x4½
Stephens, 80	2950	6	25.35	122	33x4½
Studebaker, E H	1785	6	29.40	119	32x4
Stutz, H	3250	4	30.63	130	32x4½
Stutz, H, Bearcat	3250	4	30.63	120	32x4½
Templar, 445	2685	4	18.23	118	32x4
Tulsa, E, Oil Field Sp	1335	4	19.60	117½	33x4
Velie, 48	1785	6	25.35	115	32x4
Westcott, C-38	2390	6	25.35	118	33x4
Winton, 25	4250	6	33.75	132	35x5

Limousines

NAME AND MODEL	PRICE	CYL.	HP.	W.B.	TIRES
Brewster	$9600	4	25.60	125	34x4½
Cadillac, 57	.....	8	23.44	132	35x5
Chalmers, 35-B	3175	6	25.35	117	32x4
Chandler	3395	6	29.40	123	33x4
Cunningham, V-3	On app.	8	45.00	142	35x5
Hudson, O	3775	6	29.40	125½	34x4½
Hudson, O, Touring Lim.	3425	6	29.40	125½	34x4½
Kissel, Custom Built	4350	6	26.75	124	32x4½
Locomobile, 48	9600	6	48.60	142	35x5
Locomobile, Coupe, Lim.	10900	6	48.60	142	35x5
Marmon, 34	6450	6	33.75	136	32x4½
McFarlan, 138	5950	6	48.60	136	35x5
Mercer, Series 5	6325	4	22.50	132	32x4½
Ogren, 6-60	4250	6	33.75	134	33x5
Peerless, 56, Sedan-Lim.	3900	8	25.35	125	.....
Pierce-Arrow, 38	8550	6	38.40	134	34x4½
Pierce-Arrow, 48	9250	6	4860	142	34x4½
Porter, 45	.....	4	34.18	142	35x5
Roamer, 6-54	3950	6	29.40	128	32x4
Singer, 20	7600	12	39.68	138	33x5
Standard, I	4300	8	33.80	127	34x4½
Stearns-Knight, SKL-4	4000	4	22.50	125	34x4½
Winton, 25	5200	6	33.75	132	35x5
Winton, 25	5450	6	33.75	132	35x5
Winton, 25, 4-door	5450	6	33.75	132	35x5

Broughams and Town Cars

NAME AND MODEL	PRICE	CYL.	HP.	W.B.	TIRES
Brewster	$9400	4	25.60	125	34x4½
Chalmers, 35-B	3075	6	25.35	117	32x4
Cole, 887, Town Car	4150	8	39.20	127	33x5
Franklin, 9-B	3700	6	25.35	115	32x4
Liberty, 10-C	3225	6	23.44	117	32x4
Marmon, 34, Town Car	6450	6	33.75	136	32x4½
McFarlan, 137	6200	6	48.60	136	35x5
Pierce-Arrow, 38	8550	6	38.40	134	34x4½
Pierce-Arrow, 48	9050	6	48.60	142	.....
Singer, 20	7800	12	39.68	138	33x5
Stearns-Knight, SKL-4	4150	4	22.50	125	34x4½

Buyer's Guide to Body Styles—Continued

Landaulets

NAME AND MODEL	PRICE	CYL.	HP.	W.B.	TIRES
Brewster	$9000	4	25.60	125	34x4½
Chalmers, 35-B	3175	6	25.35	117	32x4
Cunningham, V-3	Cn app.	8	45.00	142	35x5
Locomobile, 48	9600	6	48.60	142	35x5
McFarlan, 141	6200	6	48.60	136	35x5
Ogren, 6-60	4300	6	33.75	134	33x5
Pierce-Arrow, 38	8550	6	38.40	134	34x4½
Pierce-Arrow, 48	9250	6	48.60	142	.....
Singer, 20	7600	12	39.68	138	33x5

Coupes

NAME AND MODEL	PRICE	CYL.	HP.	W.B.	TIRES
Anderson, 30	.....	6	25.35	120	33x4
Apperson, 8-20, Sedanette	$4000	8	33.80	130	34x4½
Apperson, 8-20	4000	8	33.80	130	34x4½
Apperson, Anniversary	5500	8	33.80	130	34x4½
Apperson, Anniversary, Cabriolet	5500	8	33.80	130	34x4½
Auburn, 6-39	2475	6	25.35	120	33x4
Briscoe, 4-34	1885	4	18.23	109	31x4
Buick, 45-49	2085	6	27.34	118	34x4½
Cadillac, Victoria	3690	8	23.44	125	35x5
Case, V	3150	6	29.40	126	34x4½
Chalmers, 35-C	2495	6	25.35	117	32x4
Chandler	2795	6	29.40	123	33x4
Chevrolet, 490	.....	4	21.70	102	31x4
Chevrolet, F B	.....	4	21.70	110	33x4
Cleveland, 40	2195	6	21.60	112	32x4
Cole, 883, Sport	4050	8	29.20	127	33x5
Columbia	2895	6	25.35	115	32x4
Crow-Elkhart, H-56	.....	6	23.44	117	33x4
Davis, 55	2985	6	25.35	120	33x4
Dixie Flyer, H-S-60	1965	4	16.90	112	32x4
Dodge Brothers	.....	4	24.03	114	32x3½
Dorris, 6-80	5280	6	38.40	132	33x5
Dort, 15	1535	4	19.60	105½	30x3½
Economy, 6-46	2475	6	25.35	115	33x4
Elcar, K-4	1995	4	19.60	116	33x4
Elcar, K-6	2195	6	25.35	116	33x4
Ford, T	750	4	22.50	100	30x3½
Grant, H-X	2450	6	22.52	116	32x4
Haynes, 45	.....	6	29.40	127	34x4½
Haynes, 46	.....	12	36.30	127	34x4½
Holmes	3700	6	29.40	126	34x4½
Hudson, O	3075	6	29.40	125½	34x4½
Huffman, W	2565	6	25.35	120	32x4
Hupmobile, R-3	.....	4	16.90	112	32x4½
Jordan, F, Brougham	3800	6	29.40	127	32x4½
Jordan, M, Brougham	3600	6	25.35	120	32x4
Kissel, Custom Built	3975	4	26.75	124	32x4½
Klinekar, 6-55-J	2750	6	25.35	121	33x4
Lexington, S	2850	6	25.35	120	32x4
Liberty, 10-C	2495	6	23.44	117	32x4
Locomobile, 48, Cabriolet	11000	6	48.60	142	35x5
Marmon, 34	5800	6	33.75	136	32x4½
Maxwell, 25	1655	4	21.03	109	31x4
McFarlan, 134	6550	6	48.60	136	35x5
Metz, Master Six	2695	6	23.44	120	32x4
Mitchell, F-40	2500	6	25.35	120	33x4
Moon, 6-48	.....	6	29.40	125	32x4½
Moon, 6-68	.....	6	29.40	122	32x4
Nash, 684	.....	6	25.35	121	34x4½
National, B B, Sextet	4600	6	29.40	130	32x4½
Oakland, 34-C	1825	6	.....	115	32x4
Ogren, 6-60	3700	6	33.75	134	33x5
Oldsmobile, 37	2145	6	18.99	112	32x4
Overland, 4	1525	4	18.23	100	30x3½
Paige, 6-55	.....	6	29.40	127	33x4½
Peerless, 56	3500	6	25.35	125	.....
Pierce-Arrow, 38	8250	6	38.40	134	34x4½
Pierce-Arrow, 48	8750	6	48.60	142	35x5
Pilot, 6-45	2450	6	23.44	120	32x4
Reo, T 6	.....	6	24.30	120	33x4
ReVere, C	.....	4	30.63	131	32x4½
Roamer, 6-54	3750	6	29.40	128	32x4
R & V Knight, J	3700	6	29.40	127	32x4½
Scripps-Booth	.....	6	18.99	115	32x4
Stanley, 735	5975	2	.....	130	34x4½
Standard, I	.....	8	33.80	127	34x4½
Stearns-Knight, S K L 4	3150	4	22.50	125	34x4½
Stephens, 80	3050	6	25.35	122	33x4
Studebaker, E H	2585	6	29.40	119	32x4
Templar, 445	3585	4	18.23	118	32x4
Velie, 48	2485	6	25.35	115	32x4
Westcott, C-38	3190	6	25.35	118	33x4
Winton, 25, Victoria	5150	6	33.75	132	35x5

Berlines

NAME AND MODEL	PRICE	CYL.	HP.	W.B.	TIRES
Cole, 879, Sportosine	$4250	8	39.20	127	33x5
Liberty, 10-C	3325	6	23.44	117	32x4
Ogren, 6-60	4500	6	33.75	134	33x5
Pierce-Arrow, 38	8550	6	38.40	134	34x4½
Pierce-Arrow, 48	9450	6	48.60	142	.....
Singer, 20	7600	12	39.68	138	33x5

Sedans

NAME AND MODEL	PRICE	CYL.	HP.	W.B.	TIRES
Allen, 43	$2145	4	19.60	110	32x4
American	2950	6	23.44	122	32x4
American Beauty	3000	6	25.35	121	33x4
Anderson	Cn App.	6	25.35	120	33x4
Apperson, 8-20	4000	8	33.80	130	34x4½
Apperson, Anniversary	5500	8	33.80	130	34x4½
Auburn, 6-39	2475	6	25.35	120	33x4
Brewster	9400	4	25.60	125	34x4½
Briscoe, 4-34	1885	4	18.23	109	31x4
Buick, 7-pass.	2695	6	27.34	124	34x4½
Buick, 5 pass	2255	6	27.34	118	34x4½
Case, V	3300	6	29.40	126	34x4½
Chalmers, 35-C	2645	6	25.35	117	32x4
Chandler	2895	6	29.40	128	34x4½
Chevrolet, 490	1180	4	21.70	102	31x4
Chevrolet, FB	1795	4	21.70	110	33x4
Cleveland	2195	6	21.60	112	32x4
Cole, 884, Tourosine	4250	8	39.20	127	33x5
Cole, 878, Sportsedan	4150	8	39.20	127	33x5
Cole, 885 Toursedan	4250	8	39.20	127	33x5
Columbia, 20	2895	6	25.35	115	32x4
Crow-Elkhart, H-57	2395	6	23.44	117	33x4
Cunningham, V-3	On App.	8	45.00	142	35x5
Davis, 51	2985	6	25.35	120	33x4
Dixie Flyer, H-S-50	1965	4	16.90	112	32x4
Dodge Brothers	1900	4	24.03	114	32x3½
Dorris, 6-80	5720	6	38.40	132	33x5
Dort, 15	1535	4	19.60	105½	30x3½
Economy, 6-46	2475	6	25.35	115	33x4
Elcar, 4	2095	4	19.60	116	33x4
Elcar 6	2295	6	25.35	116	33x4
Elgin, K	2575	6	23.44	118	33x4
Essex, A	2350	4	18.23	108½	32x4
Ferris	.....	6	29.40	130	32x4½
Ford, T	875	4	22.50	100	30x3½
Franklin, 9-B	3750	6	25.35	115	32x4
Grant, H	2450	6	22.52	116	33x4½
Hanson, 54	2885	6	25.35	119	32x4
Haynes, 45	.....	6	29.40	127	34x4½
Haynes, 46	.....	12	36.30	127	34x4½
Holmes, 2-door	3900	6	29.40	126	34x4½
Holmes, 4-door	4250	6	29.40	126	34x4½
Hudson, O	2900	6	29.40	125½	34x4½
Huffman, W	2565	6	25.35	120	32x4
Hupmobile, R-3	.....	4	16.90	112	32x4
Jackson, 6-38	2850	6	25.35	121	33x4
Jordan, M, Silhouette S.	3600	6	25.35	120	32x4
Jordan, F, Town Sedan	3800	6	29.40	127	32x4½
King, H, Limoudan	3985	8	28.80	120	32x4½
Kissel, Custom Built	3975	6	26.75	124	32x4½
Klinekar, 6-55-J	2700	6	25.95	121	33x4
Lexington, S	2850	6	25.35	120	32x4
Liberty, 10-C	2595	6	23.44	117	32x4
Locomobile, 48	8100	6	48.60	142	35x5
Maibohm, B	2100	6	23.44	116	32x4
Marmon, 34	6250	6	33.75	136	32x4½
Maxwell, 25	1655	4	21.03	109	31x4
McFarlan, 127	5900	6	48.60	136	35x5
McFarlan, 127	6100	6	48.60	136	35x5
Metz, Master Six	2795	6	23.44	120	32x4
Mitchell, F-40	2600	6	25.35	120	33x4
Moon, 6-68	.....	6	29.40	125	33x5
Nash, 685	.....	6	25.35	127	33x4
National, BB Sextet	4700	6	29.40	130	32x4½
Oakland, 34-C	1825	6	18.97	115	32x4
Ogren, 6-60	4000	6	33.75	134	33x5
Oldsmobile, 45-B	2950	8	26.45	120	33x4½
Overland, 4	1575	4	18.23	100	30x3½
Paige, 6-42	.....	6	23.44	119	32x4
Paige, 6-55	.....	6	29.40	127	33x4½
Paterson, 6-47	2600	6	25.35	120	33x4
Peerless, 56	3700	8	33.80	125	34x4½
Pierce-Arrow, 38	8750	6	38.40	134	34x4½
Pierce-Arrow, 38	8550	6	38.40	134	34x4½
Pilot, 6-45	2500	6	23.44	120	32x4
Porter, 45, inside drive limousine	.....	4	.....	142	35x5
Premier, 6-D	5800	6	27.34	126¾	32x4½
Reo, T6	.....	6	24.30	120	33x4
ReVere	.....	4	30.63	131	32x4½
Roamer, 6-54	3850	6	29.40	128	32x4
Roamer, 6-54	4150	6	29.40	128	32x4
R & V Knight, J	3800	6	29.40	127	32x4½
R & V Knight, R	2700	4	22.50	115	32x4
Scripps-Booth, B	2175	6	18.99	115	32x4
Singer, 20	7600	12	39.68	138	33x5
Stanley, 735	6100	2	.....	130	34x4½
Standard, I	4100	8	33.80	127	34x4½
Stearns, S K L 4	3450	4	22.50	125	34x4½
Stephens, 80	3050	6	25.35	122	33x4½
Studebaker, E H	2785	6	29.40	119	32x4
Studebaker, E J	.....	6	23.44	112	32x4
Templar, 445	3585	4	18.23	118	32x4
Velie, 48	2485	6	25.35	115	32x4
Westcott, C-48	4490	6	29.40	125	32x4½
Westcott, C-38	3490	6	25.35	118	33x4
Winton, 25	5450	6	33.75	132	35x5

1920 Passenger Automobiles Listed

MAKE AND MODEL	Wheelbase	Number of Cylinders	Bore and Stroke	Piston Displacement	Make of Engine	Cylinder Shape	Camshaft Drive	Water Circulation	LUBRICATION		CARBURETION		IGNITION			ELECTRIC SYSTEM		CLUTCH	
									System	Type of Pump	Make of Carbureter	Fuel Feed	System	Make	Control	Generator Make	Voltage	Make	Type
Allen.....43	110	4	3½x5	192.4	Own.....	L...	Helical	Ther...	Circ-Spl..	Gear.....	Stromberg.	Vacuum...	Single...	Bosch.....	Hand..	Auto-Lite....	7	Borg & Beck.	Plate..
American Beauty.....	121	6	3¼x4½	224.0	Continental.	L...	Spur...	Pump..	Splash-Pr.	Gear.....	Rayfield...	Vacuum...	Single...	.....	Hand..	Westinghouse	6	Borg & Beck.	Plate..
Anderson.....30	120	6	3¼x4½	224.0	Continental.	L...	Spur...	Pump..	Splash-Pr.	.....	Rayfield...	Vacuum...	Single...	Remy.....	Hand..	Remy.....	6	Borg & Beck.	Plate..
Apperson ...Anniversary	130	8	3¼x5	331.8	Own.....	L...	Helical.	Ther...	Pressure..	Gear.....	Johnson...	Vacuum...	Single...	.....	Hand..	Bijur.....	6	Own.....	Disk..
Apperson.....8-20	130	8	3¼x5	331.8	Own.....	L...	Helical.	Ther...	Pressure..	Gear.....	Johnson...	Vacuum...	Single...	.....	Hand..	Bijur.....	6	Own.....	Disk..
Auburn.....6-39	120	6	3¼x4½	224.0	Continental.	L...	Helical.	Pump..	Splash-Pr.	Eccentric.	Rayfield...	Vacuum...	Single...	Remy.....	Hand..	Remy.....	6	Borg & Beck.	Plate..
Biddle.....B-1	121	4	3⅜x5⅛	.....	Buda.....	L...	Helical.	Ther...	Circ-Spl..	Gear.....	Zenith....	Vacuum...	Single...	Simms....	Hand..	G. & D.....	6	Warner.....	Disk..
Bour-Davis.....20	118	6	3¼x4½	224.0	Continental.	L...	Helical.	Pump..	Circ-Spl..	Piston....	Stromberg.	Vacuum...	Single...	Remy.....	Hand..	Remy.....	6	Borg & Beck.	Plate..
Brewster.....	125	4	4 x5½	276.5	Own.....	K...	Chain..	Pump..	Pressure..	Gear.....	Stromberg.	Vacuum...	Single...	Berling....	Hand..	U.S.L.....	12	Own.....	Cone..
Briscoe.....4-34	109	4	3⅜x5	178.9	Own.....	L...	Helical.	Ther...	Splash-Pr.	Piston....	Own.....	Gravity...	Single...	Conn.....	Hand..	Auto-Lite....	6	Own.....	Cone..
Buick.....45	118	6	3⅜x4½	241.6	Own.....	I...	Helical.	Pump..	Circ-Spl..	Gear.....	Marvel....	Vacuum...	Single...	Delco.....	H. & A.	Delco.....	6	Own.....	Disk..
Buick.....49	124	6	3⅜x4½	241.6	Own.....	I...	Helical.	Pump..	Circ-Spl..	Gear.....	Marvel....	Vacuum...	Single...	Delco.....	H. & A.	Delco.....	6	Own.....	Disk..
Cadillac.....57	125	8	3½x5⅛	314.4	Own.....	L...	Chain..	Pump..	Pressure..	Gear.....	Own.....	Pressure...	Single...	Delco.....	H. & A.	Delco.....	6	Own.....	Disk..
Case.....V	126	6	3½x5¼	303.1	Continental.	L...	Helical.	Pump..	Splash-Pr.	Piston....	Rayfield...	Vacuum...	Single...	Delco.....	H. & A.	Westinghouse	....	Borg & Beck.	Plate..
Chalmers.....	117	6	3¼x4½	224.0	Own.....	L...	Chain..	Ther...	Splash-Pr.	Gear.....	.....	Vacuum...	Single...	.....	Hand	.....	6	Own.....	Disk..
Chalmers.....	122	6	3¼x4½	224.0	Own.....	L...	Chain..	Ther...	Splash-Pr.	Gear.....	.....	Vacuum...	Single...	.....	Hand..	.....	6	Own.....	Disk..
Champion.....	116	4	3½x5	192.4	Lycoming...	L...	Helical.	Ther...	Non-Circ.	None....	Zenith....	Vacuum...	Single...	Delco.....	Hand..	Delco.....	6	Borg & Beck.	Plate..
Champion.....	118	4	3½x5	192.4	Hersh-Sp...	L...	Helical.	Ther...	Non-Circ.	None....	Carter....	Vacuum...	Single...	At Kent...	Hand..	Dyneto.....	6	Borg & Beck.	Plate..
Chandler.....	123	6	3½x5	288.6	Own.....	L...	Chain..	Pump..	Circ-Spl..	Piston....	Rayfield...	Vacuum...	Single...	Bosch.....	Hand..	G. & D.....	6	Borg & Beck.	Plate..
Chevrolet.....490	102	4	3 1/16x4	170.9	Own.....	I...	Helical.	Pump..	Circ-Spl..	Gear.....	Zenith....	Gravity...	Single...	Simms....	Hand..	Auto-Lite....	6	Own.....	Cone..
Chevrolet.....F.B.	110	4	3 1/16x5⅛	226.4	Own.....	I...	Helical.	Pump..	Circ-Spl..	Gear.....	Zenith....	Vacuum...	Single...	Simms....	Hand..	Auto-Lite....	6	Own.....	Cone..
Cleveland.....40	112	6	3 x4½	190.8	Own.....	I...	Chain..	Pump..	Splash-Pr.	Gear.....	Stromberg.	Vacuum...	Single...	G. & D....	Hand..	G. & D.....	6	Borg & Beck.	Plate..
Cole.....870	127	8	3½x4½	346.3	Northway..	L...	Helical.	Pump..	Splash-Pr.	Gear.....	Johnson...	Vacuum...	Single...	Delco.....	Hand..	Delco.....	6	Northway...	Cone..
Columbia.....	115	6	3¼x4½	224.0	Continental.	L...	Helical.	Pump..	Splash-Pr.	Piston....	Stromberg.	Vacuum...	Single...	At Kent...	Hand..	Auto-Lite....	6	Borg & Beck.	Plate..
Comet.....	125	6	3½x5¼	303.1	Continental.	L...	Helical.	Pump..	Circ-Spl..	Piston....	Stromberg.	Vacuum...	Single...	.....	Hand..	Wagner.....	6	Borg & Beck.	Plate..
Commonwealth.....	117	4	3½x5	192.4	Lycoming...	L...	Helical.	Ther...	Splash-Pr	Eccentric.	Carter....	Vacuum...	Single...	At Kent...	Hand..	Dyneto.....	6	Borg & Beck.	Plate..
Crow-Elkhart L-53-4-5-6	117	4	3½x5	192.4	Lycoming...	L...	Helical	Ther...	Circ-Spl..	Piston....	Zenith....	Vacuum...	Single...	Conn.....	Hand..	Dyneto.....	6	Borg & Beck.	Plate..
Crow-Elkhart H-53-4-5-6	117	6	3½x5	230.1	Rutenber...	L...	Helical.	Pump..	Circ-Spl..	Piston....	Zenith....	Vacuum...	Single...	Conn.....	Hand..	Dyneto.....	6	Borg & Beck.	Plate..
Cunningham.....V-3	132	8	3¾x5	441.7	Own.....	L...	Helical.	Pump..	Pressure..	Gear.....	Stromberg.	Vacuum...	Single...	Delco.....	Hand..	Westinghouse	6	Brown-Lipe..	Disk..
Daniels.....D-19	142 132	8	3½x5¼	404.1	Own.....	L...	Helical.	Pump..	Pressure..	Gear.....	Zenith....	Pressure...	Single...	Delco.....	Hand..	Delco.....	6	.....	Disk..
Davis.....51	120	6	3¼x4½	224.0	Own.....	L...	Helical	Pump..	Pressure.	Gear.....	Stromberg.	Vacuum...	Single...	Delco.....	Hand..	Delco.....	6	Borg & Beck.	Plate.
Dixie.....H-S 50	112	4	3¼x5	165.9	Hersh-Sp...	L...	Helical.	Ther...	Splash-Pr.	Gear.....	Stromberg	Vacuum...	Single...	.....	Hand..	Dyneto.....	6	Borg & Beck.	Plate..
Dodge Brothers.....	114	4	3⅞x4½	212.3	Own.....	L...	Helical.	Pump..	Circ-Spl..	Eccentric.	Stewart...	Vacuum...	Single...	.....	H. & A.	Northeast...	12	Own.....	Disk..
Dorris.....6-80	132	6	4 x5	377.0	Own.....	I...	Helical.	Pump..	Pressure..	Gear.....	Stromberg.	Vacuum...	Single...	Bosch.....	Hand..	Westinghouse	6	Warner.....	Disk..
Dort.....15	105½	4	3½x5	192.4	Lycoming...	L...	Helical.	Ther...	Circ-Spl..	Piston....	Carter....	Vacuum...	Single...	Conn.....	Hand..	Westinghouse	6	Own.....	Cone..
Economy.....6-46	115	6	3¼x4½	224.0	Continental.	L...	Helical.	Pump..	Splash-Pr.	Piston....	Zenith....	Vacuum...	Single...	Conn.....	Hand..	Auto-Lite....	6	Borg & Beck.	Plate..
Elcar.....	116	6	3¼x4½	224.0	Continental.	L...	Helical.	Pump..	Pressure.	Gear.....	Stromberg.	Vacuum...	Single...	.....	Hand..	Delco.....	6	Borg & Beck.	Plate..
Elcar.....	116	4	3½x5	192.4	Lycoming...	L..	Helical.	Ther...	Circ-Spl..	Eccentric.	Stromberg.	Vacuum...	Single...	.....	Hand..	Delco.....	6	Borg & Beck.	Plate..
Elgin.....	118	6	3½x4½	.....	Falls.....	I...	Helical.	Ther...	Splash-Pr.	Piston....	Stromberg.	Vacuum...	Single...	Wagner...	Hand..	Wagner.....	6	Borg & Beck.	Plate..
Essex.....A	108½	4	3⅜x5	178.9	Own.....	F...	Helical.	Ther...	Circ-Spl..	Piston....	Own.....	Vacuum...	Single...	Delco.....	Hand..	Delco.....	6	Own.....	Disk..
Ford.....T	100	4	3¾x4	176.7	Own.....	L...	Spur...	Ther...	Circ-Spl..	.....	Holley....	Gravity...	Dual....	Own.....	Hand..	Own.....	6	Own.....	Fric...
Franklin.....9	115	6	3¼x4	199.1	Own.....	I...	Helical.	Air....	Pressure..	Gear.....	Own.....	Vacuum...	Single...	At Kent...	Atmtc..	Dyneto.....	12	Borg & Beck.	Plate..
Grant.....H	116	6	3⅛x4½	198.9	Own.....	I...	Helical.	Ther...	Circ-Spl..	Gear.....	Stromberg.	Vacuum...	Single...	At Kent...	Hand..	Bijur.....	6	Borg & Beck.	Plate..
Hackett.....	114	4	3½x5	192.4	Hersh-Sp...	L ..	Helical.	Ther...	Splash-Pr.	.....	Johnson...	Vacuum...	Single...	U.S.L.....	Hand..	Westinghouse	6	Borg & Beck.	Plate..
Harroun.....A-A-2	108	4	3¼x5¼	174.2	Own.....	I...	Spur...	Ther...	Splash-Pr.	Piston....	Stromberg.	Vacuum...	Single...	Remy.....	Hand..	Remy.....	6	Own.....	Cone..
Haynes.....45	.....	6	3½x5	288.6	Own.....	L ..	Helical.	Pump..	Circ-Spl..	Piston....	Rayfield...	Vacuum...	Single...	Kingston..	Hand..	Leece-N.....	6	Borg & Beck.	Plate..

ABBREVIATIONS

2-pt—Two Point
¾ Ell—¾ Elliptic
¾ Float—¾ Floating
Amid—Amidships
Atmtc—Automatic
B & P—Ball and Plain
B & R—Ball and Roller
B R & P—Ball, Roller and Plain
Cant—Cantilever
Circ-Spl—Circulating Splash
Dual-D—Dual Double
Ell—Elliptic
F—1 Valve in Head, 1 in Side
Float—Floating
Fric—Friction
Gear—Gear Pump
H & A—Hand and Automatic
I—I-Head
K—Knight Type
L—L-Head
Mag—Magnetic
Non-Cir—Non-Circulating Splash
Opt—Optional
Plat—Platform

with Their Technical Specifications

TRANSMISSION							Gear Ratio on Direct	RUNNING GEAR				Make of Steering Gear	Make of Speedometer	Crankshaft Bearings and No.	BEARINGS			MAKE AND MODEL
GEARSET			Final Drive	Torque Taken By	Make of Rear Axle	Rear Axle Type		TIRES		Wheels	Rear Springs				Gear Set	Rear Axle	Front Wheel	
Make	Location	Speeds						Front	Rear									
Own	Unit E.	3	Sp.B.	Springs.	Columbia.	¾ Float.	4.63	32x4	32x4	Opt.	S-E.	Ditweiler	Stewart	Plain 3.	Roller.	Roller.	Roller.	Allen 43
Detroit	Unit E.	3	Bevel.	Springs.	Timken.	Semi-F.	4.90	33x4	33x4	Opt.	S-E.	Standard		Plain 3.	Ball.	Roller.	Roller.	American Beauty
Durston	Unit E.	3	Sp.B.	Springs.	Salisbury.	Float.	4.50	33x4	33x4	Wood.	S-E.	Jacox	Stewart	Plain 4.				Anderson 30
Own	Amid.	3	Sp.B.	Springs.	Own.	¾ Float.	4.25	33x4	33x4	Wire.	¾-Ell.	Own	VanSicklen.	Plain 3.	Roller.	Roller.	Roller.	Apperson Anniversary
Own	Amid.	3	Sp.B.	Springs.	Own.	¾ Float.	4.25	34x4½	34x4½	Wood.	¾-Ell.	Own	VanSicklen.	Plain 3.	Roller.	Roller.	Roller.	Apperson 8-20
Grant-Lees.	Unit E.	3	Sp.B.	Springs.	Columbia	Float.	4.66	33x4	33x4	Wood.	S-E.	Jacox	Stewart	Plain 3.	Ball.	Roller.	Roller.	Auburn 6-39
Warner	Unit E.	4	Sp.B.	Springs.	Stanpar.	Semi-F.	4.50	32x4	32x4	Opt.	S-E.	Gemmer	Stewart	Plain 3.	Ball.	Roller.	Roller.	Biddle B-1
Detroit	Unit E.	3	Sp.B.	Springs.	Salisbury.	¾ Float.	4.75	32x4	32x4	Wood.	S-E.	C.A.S.	Stewart	Plain 3.	Ball.	B.&R.	Roller.	Bour-Davis 20
Own	Unit T.	3	Sp.B.	Springs.	Own.	Float.	4.50	34x4½	34x4½	Wood.	Cant.	Own	Stewart	Plain 3.	Ball.	Ball.	Roller.	Brewster
Own	Unit E.	3	Sp.B.	Tor-A.	Own.	¾ Float.	4.18	31x4	31x4	Opt.	S-E.	Own	Stewart	Plain 3.	B.&P.	B.&R.	Ball.	Briscoe 4-34
Own	ait E	3	Bevel	Springs	Own.	Float.	4.00	33x4	33x4	Wood.	Cant.	Own	Allis-Chal's	Plain 4.	Ball.	B. & R.	Roller.	Buick 45
Own	Unit E.	3	Bevel.	Sprin s	Own.	Float.	4.00	34x4½	34x4½	Wood.	Cant.	Own	Allis-Chal's.	Plain 4.	&all.	B. & R.	Roller.	Buick 49
Own	Unit E.	3	Sp.B.	Springs.	Timken.	Float.	4.44	35x5	35x5	Wood.	Plat.	Own	VanSicklen.	Plain 3.	B.&R.		Roller.	Cadillac 57
Grant-Lees.	Unit E.	3	Sp.B.	Springs.		Float.	4.45	34x4½	34x4½	Wood.	S-E.	Jacox	VanSicklen.	Plain 3.	Ball.	Roller.	Roller.	Case V
Own	Unit E.	3	Sp.B.	Springs.		Semi-F.	4.75	32x4	32x4	Wood.	S-E.	Own		Plain.	B.&R.	Roller.	Roller.	Chalmers
Own	Unit E.	3	Sp.B.	Springs.		Semi-F.	5.18	33x4½	33x4½	Wood.	S-E.	Own		Plain.	B.&R.	Roller.	Roller.	Chalmers
Grant-Lees.	Unit E.	3		Springs.	Peru.	Float.	4.25	32x3½	32x3½	Wood.	S-E.	C.A.S.	Stewart	Plain 2.	Ball.	Roller.	Roller.	Champion
Grant-Lees.	Unit E.	3		Springs.	Peru.	Float.	4.25	32x4	32x4	Wood.	S-E.	C.A.S.	VanSicklen.	Plain 2.	Ball.	Roller.	Roller.	Champion
Own	Unit E.	3	Sp.B.	Springs.	Own.	¾ Float.	4.40	33x4	33x4	Wood.	S-E.	Opt.	Stewart	Plain 3.	Ball.	Ball.	Roller.	Chandler
Own	Unit E.	3	Sp.B.	Springs.	Own.	¾ Float	3.63	31x4	31x4	Wood.	S-E.	Own	Stewart	Plain 3.	Ball.	Roller.	Ball.	Chevrolet 490
Own	Unit E.	3	Sp.B.	Springs.	Own.	Semi-F.	4.62	33x4	33x4	Wood.	¼-Ell.	Warner	Stewart	Plain 3.	Ball.	Roller.	Ball.	Chevrolet F.B.
Mechanics.	Unit E.	3	Sp.B.	Springs.	Own.	Semi-F.	4.45	32x4	32x4	Wood.	S-E.	Ditweiler	VanSicklen.	Plain 3.	Ball.	Roller.	Roller.	Cleveland 40
Northway	Unit E.	3	Sp.B.	Springs.	Columbia.	Float.	4.45	33x5	33x5	Wood.	S-E.	Gemmer	Stewart	Plain 3.	B.&R.	Roller.	Roller.	Cole 870
Durston	Unit E.	3	Sp.B.	Springs.	Timken.	Semi-F.	4.75	32x4	32x4	Opt.	Cant.	Gemmer	Stewart	Plain 3.	B.&P.	Roller.	Roller.	Columbia
Muncie	Unit E.	3	Sp.B.	Tor-A.	Columbia.	¾ Float.	4.66	33x4	33x4	Opt.	Cant.	Gemmer	Stewart	Plain 3.	Roller.	Roller.	Roller.	Comet
Grant-Lees.	Unit E.	3	Sp.B.	Springs.	Peru.	Float.	4.25	32x4	32x4	Wood.	S-E.	C.A.S.	VanSicklen.	Plain 2.	Ball.	Ball.	Roller.	Commonwealth
Covert	Unit E.	3	Sp.B.	Springs.	Peru.	Float.	4.25	32x3½	32x3½	Opt.	Ell.	Ditweiler	Stewart	Plain 1.	Roller.	Roller.	Roller.	Crow-Elkhart L-53-4-5-6
Covert	Unit E.	3	Sp.B.	Springs.	Peru.	Float.	4.25	33x4	33x4	Opt.	Ell.	Ditweiler	Stewart	Plain 1.	Ball.	Roller.	Roller.	Crow-Elkhart H-53-4-5-6
Brown-Lipe.	Unit E.	3	Sp.B.	Springs.	Timken.	Float.	4.08	35x5	35x5	Opt.	¾ Ell.	Gemmer	Stewart	Plain 3.	B.&R.	Roller.	Roller.	-7 Cunningham V-3
Own	Unit E.	3	Sp.B.	Tor-A.	Timken.	Float.	4.40	34x4½	34x4½	Opt.	S-E.	Gemmer	Stewart	Plain 3.	Ball.	Roller.	Roller.	Daniels D-19
T.W.Warner.	Unit E.	3	Sp.B.	Springs.	Salisbury.	Float.	4.75	33x4	33x4	Wood.	S-E.	T.W.Warner	Stewart	Plain 4.	Ball.	B.&R.	Roller.	Davis 51
Grant-Lees.	Unit E.	3	Sp.B.	Tor-T.	Peru.	Float.	4.72	32x4	32x4	Opt.	¾-Ell.	C.A.S.	VanSicklen.	Plain 2.	Ball.	Roller.	Roller.	Dixie H-S 50
Own	Unit E.	3	Sp.B.	Springs.	Own.	Float.	4.16	32x3½	32x3½	Wood.	¾ Ell.	Own	Johns-Man.	Plain 3.	Ball.	Roller.	Roller.	Dodge Brothers
Warner	Unit E.	3	Sp.B.	Springs.	Timken.	Float.	3.50	33x5	33x5	Wood.	S-E.	Ross	VanSicklen.	Plain 7.	B.&R.	Roller.		Dorris 680
Mechanics.	Unit E.	3	Bevel.	Springs.	Flint.	¾ Float.	4.07	30x3½	30x3½	Opt.	Cant.	Jacox	Stewart	Plain 2.	B.&P.	Roller.	Roller.	Dort 15
Durston	Unit E.	3	Sp.B.	Springs.	Salisbury.	¾ Float.	4.50	33x4	33x4	Opt.	S-E.	Ditweiler	Stewart	Plain 3.	Ball.	Ball.	Roller.	Economy 6-46
Muncie	Unit E.	4	Sp.B.	Springs.	Salisbury	¾ Float.	4.50	33x4	33x4	Wood.	S-E.	C.A.S.	Stewart	Plain 4.	Ball.	Ball.	Roller.	Elcar
Muncie	Unit E.	4	Sp.B.	Spring .	Salisbu .	¾ Float	4.50	33x4	33x4	Wood.	S-E.	C.A.S.	Stewart	Plain 2.	Ball.	Ball.	Roller.	Elcar
Mechanics.	Unit E.	3	Sp.B.	Spring .	Columbia	¾ Float.	5.09	33x4	33x4	Wood.	Cant.	C.A.S.	Van Sicklen.	Plain 3.	Ball.	Roller.	Roller.	Elgin
Own	Unit E.	3	Sp.B.	Springs.	Timken.	Semi-F.	5.09	32x4	32x4	Opt.	S-E.	Gemmer	Stewart	Plain 3.	Roller.	Roller.	Roller.	Essex A
Own	Unit E.	2	Bevel.	R-R.,T-A.	Own.	Semi-F.	3.63	30x3	30x3½	Wood.	S-E.	Own		Plain 3.	Plain.	Roller.	B.&R.	Ford T
Own	Amid.	3	Sp.B.	Springs.	vn.	Semi-F.	4.33	32x4	32x4	Wood.	Ell.	Own	Stewart	Plain 7.	Ball.	Ball.	Ball.	Franklin 9
Durston	Unit E.	3	Sp.B.	Springs.	Columbia.	¾ Float.	4.63	32x4	32x4	Wood.	S-E.	Jacox	VanSicklen.	Plain 3.	B.&P.	Roller.	Roller.	Grant H
Grant-Lees.	Unit E.	3	Sp.B.	Springs.	Stanpar.	Semi-F.	4.75	32x4	32x4	Wood.	¾-Ell.	Gemmer	Stewart	Plain 2.	Ball.	Roller.	Roller.	Hackett
Grant-Lees.	Unit E.	3	Bevel.	Springs.	Adams.	¾ Float.	4.00	30x3½	30x3½	Wood.	Cant.	Lavine		Plain 3.	Ball.	B.&R.	Roller.	Harroun A-A-2
Own	Unit E.	3	Sp.B.	Springs.	Own.	¾ Float.	4.42	34x4½	34x4½	Wood.	S-E.	Jacox	Stewart	Plain 3.	Ball.	Ball.	Ball.	Haynes 45

Rad-Rd—Radius Rods
S-E—Semi-Elliptic
Semi-F—Semi-Floating
Sp.B—Spiral Bevel
Splash-Pr—Splash Pressure

Spur—Spur Gears
T—T-Head
Ther—Thermo-Syphon
Tor-A—Torsion Arm
Tor-T—Torsion Tube
Trans—Transverse
Unit-E—Unit with Engine

Unit-T—Unit with Torque Tube
Unit-A—Unit with Axle

EQUIPMENT

At Kent—Atwater Kent
G. & D.—Gray & Davis

Hersh-Sp—Herschell-Spillman
Johns-Man—Johns-Manville
Leece-N—Leece-Neville
Teet-Hart—Teetor-Hartley
Ward-L—Ward Leonard
West-M—Weston-Mott

1920 Passenger Automobiles Listed with

MAKE AND MODEL	Wheelbase	Number of Cylinders	Bore and Stroke	Piston Displacement	Make of Engine	Cylinder Shape	Camshaft Drive	Water Circulation	LUBRICATION		CARBURETION		IGNITION			ELECTRIC SYSTEM		CLUTCH	
									System	Type of Pump	Make of Carbureter	Fuel Feed	System	Make	Control	Generator Make	Voltage	Make	Type
Haynes.....46	.....	12	2¾x5	356.4	Own.....	I...	Chain..	Pump..	Pressure..	Gear.....	Rayfield...	Vacuum...	Single...	Delco.....	Hand..	Leece-N.....	6	Borg & Beck.	Plate..
Hollier.....206-B	120	6	3¼x4½	224.0	Continental	L...	Helical.	Pump..	Splash-Pr.	Piston...	Zenith....	Vacuum...	Single...	Remy.....	Hand..	Westinghouse	6	Fuller.....	Disk..
Holmes.....	126	6	3½x4¼	245.3	Own.....	I...	Helical.	Air....	Pressure..	Gear.....	Newcomb..	Vacuum...	Dual....	Eisemann..	Atmtc..	Dyneto.....	12	Brown-Lipe..	Disk..
Hudson.....O	125½	6	3½x5	288.6	Own.....	L...	Helical.	Pump..	Circ-Spl..	Piston...	Own.....	Vacuum...	Single...	Delco.....	Atmtc..	Delco.....	6	Own.....	Disk..
Hupmobile.....R-3	112	4	3½x5½	182.5	Own.....	L...	Chain..	Ther...	Splash-Pr.	Gear.....	Stromberg.	Vacuum...	Single...	At Kent...	Hand..	Westinghouse	6	Own.....	Disk..
Jones.....28	126	6	3½x5¼	303.1	Continental.	L...	Helical.	Pump..	Circ-Spl..	Eccentric.	Rayfield...	Vacuum...	Single...	Auto-Lite..	Hand..	Auto-Lite....	6	Borg & Beck.	Plate..
Jordan.....M	120	6	3¼x4½	224.0	Continental.	L...	Helical.	Pump..	Splash-Pr.	Gear.....	Stromberg.	Vacuum...	Single...	Delco.....	Hand..	Delco.....	6	Detroit.....	Plate..
Jordan.....F	127	6	3½x5¼	303.1	Continental.	L...	Helical.	Pump..	Splash-Pr.	Piston...	Stromberg.	Vacuum...	Single...	Delco.....	Hand..	Delco.....	6	Detroit.....	Plate..
King.....H	120	8	3 x5	282.7	Own.....	L...	Chain..	Ther...	Pressure..	Gear.....	Ball.....	Vacuum...	Single...	.....	Hand..	Westinghouse	6	Detroit.....	Plate..
Kissel.....45	124	6	3 7/16x5½	284.4	Own.....	F...	Spur...	Pump..	Splash-Pr.	Gear.....	Stromberg.	Vacuum...	Single...	Bosch.....	Hand..	Remy.....	.....	Warner.....	Disk..
Kline.....6-55-J	121	6	3¼x4½	224.0	Continental.	L...	Spur...	Pump..	Pressure..	Gear.....	Rayfield...	Vacuum...	Single...	.....	Hand..	Wagner.....	6	Borg & Beck.	Plate..
Lexington.....S	120	6	3¼x4½	224.0	Continental.	L...	Helical.	Pump..	Pressure..	Gear.....	Rayfield...	Vacuum...	Single...	Conn.....	Hand..	G. & D.....	6	Borg & Beck.	Plate..
Liberty.....10-C	117	6	3½x5	230.1	Own.....	L...	Helical.	Ther...	Pressure..	Gear.....	Stromberg.	Vacuum...	Single...	Wagner...	Hand..	Wagner.....	6	Borg & Beck.	Plate..
Locomobile.....48	142	6	4½x5½	524.8	Own.....	T...	Helical.	Pump..	Splash-Pr.	Gear.....	Own.....	Pressure...	Double..	Berling....	Hand..	Westinghouse	6	Own.....	Disk..
Maibohm.....B	116	6	3½x4¼	195.6	Falls.....	I...	Helical.	Ther...	Splash-Pr.	Piston...	Stromberg.	Vacuum...	Single...	At Kent...	Hand..	Bijur.....	6	Borg & Beck.	Plate..
Marmon.....34	136	6	3⅜x5½	339.7	Own.....	I...	Helical.	Pump..	Pressure..	Gear.....	Stromberg.	Gravity...	Single...	Delco.....	Hand..	Delco.....	6	Own.....	Plate..
Maxwell.....25	109	4	3⅝x4½	185.8	Own.....	L...	Helical.	Ther...	Splash-Pr.	Piston...	.....	Vacuum...	Single...	.....	Hand..	.....	12	Own.....	Cone..
McFarlan.....127	136	6	4½x6	572.5	Teet.-Hart..	T...	Helical.	Pump..	Splash-Pr.	Piston...	Stromberg.	Vacuum...	Double..	Bosch.....	Hand..	Westinghouse	6	Borg & Beck.	Plate..
Mercer.....5	115	4	3¾x6¾	298.2	Own.....	L...	Chain..	Pump..	Splash-Pr.	Gear.....	Ball.....	Vacuum...	Single...	Berling....	Hand..	Westinghouse	6	Own.....	Disk..
Meteor.....	132 129	4	4 x6	301.6	Duesenberg.	F...	Chain..	Pump..	Splash-Pr.	Gear.....	Zenith....	Vacuum...	Single...	Simms....	Hand..	Bijur.....	6	Borg & Beck.	Plate..
Metz.....	120	6	3½x5	230.1	Rutenber...	T...	Helical.	Pump..	Splash-Pr.	Gear.....	Stromberg.	Vacuum...	Single...	Conn.....	Hand..	Westinghouse	6	Borg & Beck.	Plate..
Mitchell.....F-40	120	6	3¼x5	248.9	Own.....	L...	Helical.	Pump..	Splash-Pr.	Piston...	Rayfield...	Vacuum...	Single...	Remy.....	Hand..	Remy.....	6	Borg & Beck.	Plate..
Moline-Knight.....R	.....	4	3¾x5	220 9	Own.....	K...	Chain..	Ther...	Splash-Pr.	Gear.....	Schebler...	Vacuum...	Single...	.....	Hand..	Wagner.....	6	Borg & Beck.	Plate..
Moline-Knight.....J	.....	6	3½x4½	259.8	Own.....	K...	Chain..	Ther...	Splash-Pr.	Gear.....	Schebler...	Vacuum...	Single...	.....	Hand..	Wagner.....	6	Borg & Beck.	Plate..
Monroe.....	115	4	3¼x4½	149.3	Own.....	F...	Helical.	Ther...	Pressure.	Gear.....	Zenith....	Vacuum...	Single...	U.S.L.....	Hand..	Auto-Lite....	6	Own.....	Disk..
Moon..... Victory	122	6	3¼x4½	224.0	Continental	L...	Helical.	Pump..	Splash-Pr.	Piston...	Rayfield...	Vacuum...	Single...	.....	Atmtc..	Delco.....	6	Borg & Beck.	Plate..
Moon.....6-68	125	6	3½x5¼	303.1	Continental	L...	Helical.	Pump..	Splash-Pr.	Piston...	Rayfield...	Vacuum...	Single...	.....	Atmtc..	Delco.....	6	Borg & Beck.	Plate..
Nash 681-2-4-5-6-7	121	6	3¼x5¼	261.3	Own.....	I...	Helical.	Pump..	Circ-Spl..	Gear.....	Marvel....	Vacuum...	Single...	.....	Atmtc..	Wagner.....	6	Borg & Beck.	Plate..
National.....Sextet	130	6	3½x5¼	303.1	Own.....	I...	Chain..	Pump..	Pressure..	Gear.....	Rayfield...	Vacuum...	Single...	Delco.....	H. & A.	Westinghouse	6	Borg & Beck.	Plate..
Nelson.....D	104	4	3⅛x4¾	145.7	Own.....	I...	Helical.	Ther...	Pressure..	Gear.....	Zenith....	Vacuum...	.....	Bosch.....	Hand..	U.S.L.....	12	Own.....	Disk..
Noma.....1-B	128	6	3¼x4½	224.0	Continental.	L...	Helical.	Pump..	Pressure..	Gear.....	Zenith....	Vacuum...	Single...	Delco.....	Hand..	Delco.....	6	Borg & Beck.	Plate..
Oakland.....34-C	115	6	2 13/16x4¾	177.0	Own.....	I...	Helical.	Pump..	Pressure..	Gear.....	Marvel....	Vacuum...	Single...	Bosch.....	Hand..	Remy.....	6	Own.....	Cone..
Oldsmobile.....37-A	112	6	2 13/16x4¾	177.0	Own.....	I...	Helical	Pump..	Pressure..	Gear.....	Johnson...	Vacuum...	Single...	.....	Hand..	Remy.....	6	Own.....	Cone..
Oldsmobile.....45-B	122	8	2 7/8x4¾	246.7	Own.....	T...	Helical	Pump..	Pressure..	Gear.....	Ball.....	Vacuum...	Single...	.....	Hand..	Delco.....	6	Own.....	Cone..
Overland.....4	100	4	3⅜x4	143.1	Own.....	L...	Helical.	Ther...	Splash-Pr.	Flywheel.	Tillotson..	Gravity...	Single...	Conn.....	Hand..	Auto-Lite....	6	Borg & Beck.	Disk..
Packard.....335	136	12	3 x5	424.1	Own.....	L...	Chain..	Pump..	Pressure..	Gear.....	Own.....	Pressure...	Single...	Delco.....	H. & A.	Bijur.....	6	Own.....	Disk..
Packard.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Paige.....6-42	119	6	3½x5	230.1	Own.....	L...	Helical.	Pump..	Splash-Pr.	Piston...	Stromberg.	Vacuum...	Single...	At Kent...	H. & A.	G. & D.....	6	Borg & Beck.	Plate..
Paige.....6-55	127	6	3½x5¼	303.1	Continental.	L...	Helical.	Pump..	Splash-Pr.	Piston...	Rayfield...	Vacuum...	Single...	At Kent...	H. & A.	G. & D.....	6	Borg & Beck.	Plate..
Paterson.....6-47	120	6	3¼x4½	224.0	Continen tal	L...	Helical.	Pump..	Splash-Pr.	Piston...	Stromberg.	Vacuum...	Single...	.....	Hand..	Delco.	6	Borg & Beck.	Plate..
Peerless.....56	125	8	3¼x5	331.8	Own.....	L...	Helical.	Pump..	Pressure.	Gear.....	Ball.....	Vacuum...	Single...	Auto-Lite..	H. & A.	Auto-Lite....	6	Brown-Lipe..	Disk..
Piedmont.....6-40	122	6	3¼x4½	224.0	Continental.	L...	Helical.	Pump..	Non-Circ.	Piston...	Stromberg.	Vacuum...	Single...	Remy.....	Hand..	Remy.....	6	Borg & Beck.	Plate..
Piedmont.....	116	4	3½x5	.....	Lycoming...	L...	Helical.	Pump..	Circ-Spl..	Piston...	Carter....	Vacuum...	Single...	Delco.....	Hand..	Dyneto.....	6	Borg & Beck.	Plate..
Pierce-Arrow.....31	134	6	4 x5½	192.4	Own.....	T...	Helical.	Pump..	Pressure..	Gear.....	Own.....	Pressure...	Dual-D..	Delco.....	H. & A.	Westinghouse	6	Own.....	Cone..

ABBREVIATIONS

2-pt—Two Point
¾ Ell—¾ Elliptic
¾ Float—¾ Floating
Amid—Amidships
Atmtc—Automatic
B & P—Ball and Plain
B & R—Ball and Roller
B R & P—Ball, Roller and Plain
Cant—Cantilever
Circ-Spl—Circulating Splash
Dual-D—Dual Double
Ell—Elliptic
F—1 Valve in Head, 1 in Side
Float—Floating
Fric—Friction
Gear—Gear Pump
H & A—Hand and Automatic
I—I-Head
K—Knight Type
L—L-Head
Mag—Magnetic
Non-Cir—Non-Circulating Splash
Opt—Optional
Plat—Platform

Their Technical Specifications—Continued.

TRANSMISSION							Gear Ratio on Direct	RUNNING GEAR				Make of Steering Gear	Make of Speedometer	BEARINGS				MAKE AND MODEL
GEARSET			Final Drive	Torque Taken By	Make of Rear Axle	Rear Axle Type		TIRES		Wheels	Rear Springs			Crankshaft Bearings and No.	Gear Set	Rear Axle	Front Wheel	
Make	Location	Speeds						Front	Rear									
Own	Unit E.	3	Sp.B.	Springs.	Own.	¾ Float.	4.07	34x4½	34x4½	Wire.	S-E.	Jacox	Stewart	Plain 3.	Ball.	Ball.	Ball.	Haynes 46
Fuller	Unit E.	3	Sp.B.	Springs.	Own.	Float.	4.41	32x4	32x4	Opt.	Cant.	T.W.Warner.	Stewart	Plain 3.	Ball.	Ball.	Ball.	Hollier 206-B
Brown-Lipe.	Unit E.	3	Sp.B.	Springs.	Timken.	Semi-F.	4.90	34x4½	34x4½	Wood.	Ell.	Gemmer	VanSicklen.	Plain 7.	Roller.	Roller.	Roller.	Holmes
Own	Unit E.	3	Sp.B.	Springs.	Timken.	Semi-F.	4.45	34x4½	34x4½	Opt.	S-E.	Gemmer	Stewart	Plain 4.	Roller.	Roller.	Roller.	Hudson O
Own	Unit E.	3	Sp.B.	Springs.	Own.	¾ Float.	4.87	32x4	32x4	Wood.	S-E.	Jacox	VanSicklen.	Plain 3.	B.R.P.	B.&R.	Ball.	Hupmobile R-3
Grant-Lees.	Unit E.	3	Sp.B.	Springs.	Stanpar.	¾ Float.	4.50	34x4	34x4	Opt.	S-E.	C.A.S.	Stewart	Plain.	Ball.	Roller.	Roller.	Jones 28
Detroit	Unit E.	3	Sp.B.	Springs.	Timken.	Semi-F.	4.66	32x4	32x4	Wood.	S-E.	Gemmer	VanSicklen.	Plain 4.	B.&P.	Roller.	Roller.	Jordan M
Detroit	Unit E.	3	Sp.B.	Springs.	Timken.	Semi-F.	4.08	32x4½	32x4½	Wood.	S-E.	Gemmer	VanSicklen.	Plain 3.	B.&P.	Roller.	Roller.	Jordan F
Own	Unit E.	3	Sp.B.	Springs.	Columbia.	¾ Float.	4.08	32x4½	32x4½	Opt.	Cant.	Jacox	VanSicklen.	Plain 3.	Ball.	Roller.	Ball.	King H
Warner	Unit E.	3	Sp.B.	Springs.	Own.	Float.	3.62	32x4½	32x4½	Wire.	¾-Ell	Jacox	Stewart	Plain 3.	Plain.	Roller.	Roller.	Kissel 45
Grant-Lees.	Unit E.	3	Sp.B.	Springs.	Stanpar.	Float.	4.50	33x4	33x4	Wood.	¾-Ell	Wohlrab		Plain 4.	Roller.	Roller.	Roller.	Kline 6-55-J
Warner	Unit E.	3	Sp.B.	Springs.	Own.	Float.	4.66	32x4	32x4	Wood	S-E.	C.A.S.		Plain 4.	B.&R.	Ball.	Ball.	Lexington S
Detroit	Unit E.	3	Sp.B.	Springs.	Timken.	Semi-F.	4.66	32x4	[illegible]	Wood.	S-E.	Gemmer	Stewart	Plain 4.	B.&P.	Roller.	Roller.	Liberty 10-C
Own	Amid.	4	Sp.B.	R-R.,T-A.	Own.	Float.	3.80	35x5	35x5	Wood.	¾-Ell.	Own	Stewart	Plain 7.	Ball.	Ball.	Roller.	Locomobile 48
Muncie	Unit E.	3	Sp.B.	Springs.	Peru.	Float.	4.50	32x3½	32x3½	Wood.	S-E.	Jacox	Stewart	Plain 3.	Ball.	Roller.	Roller.	Maibohm B
Own	Unit T.	3	Sp.B.	Rad-Rd.	Own.	¾ Float.	3.75	32x4½	32x4½	Wire.	Trans.	Own	VanSicklen.	Plain 3.	B.R.P.	B.&R.	Roller.	Marmon 34
Own	Unit E.	3	Bevel.	Springs.	Own.	¾ Float.		30x3½	30x3½	Wood.	S-E.	Own		Plain 2.	Roller.	Roller.	Ball.	Maxwell 25
Brown-Lipe.	Amid.	3	Sp.B.	Springs.	Timken.	Float.	3.58	35x5	35x5	Opt.	S-E.	T.W.Warner.	Stewart	Plain 4.	Roller.	Roller.	Roller.	McFarlan 127
Own	Amid.	4	Sp.B.	Springs.	Own.	Float.	3.22	32x4½	32x4½	Opt.	S-E.	Gemmer	Stewart	Plain 3.	Roller.	B.&R.	Roller.	Mercer 5
Own	Amid.	4	Sp.B.	Springs.	Stanpar.		4.41	32x4½	32x4½	Wire.	S-E.	Gemmer	Stewart	Plain.	Ball.	Roller.	Roller.	Meteor
Brown-Lipe.	Unit E.	3	Sp.B.	Springs.	Timken.	¾ Float	4.63	32x4	32x4	Wood.	S-E.	Warner		Plain 3.	Ball.	Roller.	Roller.	Metz
Own	Amid.	3	Sp.B.	Springs.	Own.	Floa	4.41	33x4	33x4	Wood.	Cant.	Own	Stewart	Plain 3.	B.&R.	B.&R.	Roller.	Mitchell F-40
Brown-Lipe.	Unit E.		Sp.B.	Springs.	Salisbury.	Semi-F.	4.75	32x4	32x4	Opt.	S-E.	Jacox	Stewart	Plain 3.	B.R.P.	B.&R.	Roller.	Moline-Knight R
Brown-Lipe	Unit E.	3	Sp.B.	Springs.	Timken.	Semi-F.	4.90	32x4½	32x4½	Opt.	S-E.	Jacox	Stewart	Plain 3.	B.&R.	Roller.	Roller.	Moline-Knight J
Muncie	Unit E.	3	Sp.B.	Tor-A.	Own.	¾ Float.	4.50	32x3½	32x3½	Wood.	Cant.	C.A.S.	Stewart	Plain 2.	Ball.	Roller.	Roller.	Monroe
Brown-Lipe	Unit E.	3	Sp.B.	Springs.	Timken.	Semi-F.	4.75	32x4	32x4	Opt.	S-E.	Warner	VanSicklen.	Plain 4.	Ball.	Roller.	Roller.	Moon Victory
Brown-Lipe.	Unit E.	3	Sp.B.	Springs.	Timken.	¾ Float.	4.45	33x5	33x5	Opt.	S-E.	Warner	VanSicklen.	Plain 4.	Ball.	Roller.	Roller.	Moon 6-68
Own	Unit E.	3	Sp.B.	Springs.	Own.	Semi-F.	4.50	33x4	34x4½	Wood.	S-E.	Gemmer	Stewart	Plain 3.	Roller.	Roller.	Roller.	Nash 681-2-4-5-6-7
Brown-Lipe.	Unit E.	3	Sp.B.	Springs.	Columbia.	Float.	4.08	32x4½	32x4½	Wood.	S-E.	Warner	Stewart	Plain 3.	B.&R.	Roller.	Roller.	National Sextet
Own	Unit A.	3	Sp.B.	Tor-A.	Own.	Float.	4.25	32x4	32x4	Wood.	Trans.	Own	Stewart	Plain 2.	B.&R.	B.&R.	Ball.	Nelson D
Detroit	Unit E.	3	Sp.B.	Springs.	Timken.	¼ Float.		32x4½	32x4½	Wire.	S-E.	Lavine		Plain 4.	Ball.	Roller.	Roller.	Noma 1-B
Muncie	Unit E.	3	Bevel.	Springs.	West-M.	Float.	4.50	32x4	32x4	Opt.	S-E.	Lavine	Stewart	Plain 3.	B.&P.	B.&R.	Ball.	Oakland 34-C
Northway	Unit E.	3	Sp.B.	Springs.	West-M.	Float.	4.58	32x4	32x4	Wood.	S-E.	Jacox	Stewart	Plain 3.	B.&R.	B.&R.	Roller.	Oldsmobile 37-A
Warner	Unit E.	3	Sp.B.	Springs.	West-M.	Float.	4.91	33x4½	33x4½	Wood.	Plat.	Jacox	Stewart	Plain 2.	Ball.	B.&R.	Ball.	Oldsmobile 45-B
Own	Unit E.	3	Sp.B.	Springs.	Own.	¾ Float.	4.50	30x3½	30x3½	Wood.	Cant.	Own		Plain 3.	Ball.	Ball.	Roller.	Overland 4
Own	Amid.	3	Sp.B.	Springs.	Own.	Semi-F.	4.36	35x5	35x5	Wood.	S-E.	Own	Waltham	Plain 3.	Ball.	Ball.	Roller.	Packard 335
																		Packard
Own	Unit E.	3	Sp.B.	Springs.	Salisbury	¾ Float	4.50	32x4	32x4	Wood.	S-E.	Jacox	Stewart	Plain 3.	B.R.P.	B.&R.	Roller.	Paige 6-42
Own	Unit E.	3	Sp.B.	Tor-A.	Salisbury	¾ Float	4.33	33x4½	33x4½	Wood.	Cant.	Jacox	Stewart	Plain 3.	B.R.P.	Roller.	Roller.	Paige 6-55
Durston	Unit E.	3	Sp.B.	Springs.	Stanpar.	Semi-F.	4.50	33x4	33x4	Wood.	S-E.	Jacox	Stewart	Plain 3.	Ball.	Roller.	Roller.	Paterson 6-47
Brown-Lipe.	Unit E.	3	Sp.B.	Springs.	Timken.	Semi-F.	4.54	34x4½	34x4½	Wood.	Plat.	Gemmer		Plain 3.	B.&R.		Roller.	Peerless 56
Grant-Lees.	Unit E.	3	Sp.B.	Springs.	Spacke.	¾ Float.	4.45	32x4	32x4	Wood.	S-E.	Warner	Stewart	Plain 4.	Roller.	Roller.	Roller.	Piedmont 6-40
Grant-Lees.	Unit E.	3	Sp.B.	Springs.	Peru.	Float.	4.45	32x3½	32x3½	Wood.	S-E.	Ditweiller	Stewart	Plain 3.	B.&R.	B.&R.	Roller.	Piedmont
Own	Amid.	4	Sp.B.	Springs.	Own.	Semi-F.	3.78	34x4½	34x4½	Wood.	¾-Ell.	Own	Waltham	Plain 7.	Ball.	B.&R.	Roller.	Pierce-Arrow 31

Rad-Rd—Radius Rods
S-E—Semi-Elliptic
Semi-F—Semi-Floating
Sp.B—Spiral Bevel
Splash-Pr—Splash Pressure
Spur—Spur Gears
T—T-Head
Ther—Thermo-Syphon
Tor-A—Torsion Arm
Tor-T—Torsion Tube
Trans—Transverse
Unit-A—Unit with Axle
Unit-E—Unit with Engine
Unit-T—Unit with Torque Tube

EQUIPMENT

At Kent—Atwater Kent
G. & D.—Gray & Davis
Hersh-Sp—Herschell-Spillman
Johns-Man—Johns-Manville
Leece-N—Leece-Neville
Teet-Hart—Teetor-Hartley
Ward-L—Ward Leonard
West-M—Weston-Mott

1920 Passenger Automobiles Listed with

MAKE AND MODEL	Wheelbase	Number of Cylinders	Bore and Stroke	Piston Displacement	Make of Engine	Cylinder Shape	Cam-shaft Drive	Water Circu-lation	LUBRICATION		CARBURETION		IGNITION			ELECTRIC SYSTEM		CLUTCH	
									System	Type of Pump	Make of Carbu-reter	Fuel Feed	Sys-tem	Make	Con-trol	Generator Make	Voltage	Make	Type
Pierce-Arrow.....51	142	6	4½x5½	524.8	Own.....	T...	Helical	Pump..	Pressure..	Gear.....	Own.....	Pressure...	Dual-D..	Delco.....	H. & A.	Westinghouse	6	Own.....	Cone..
Pilot.....6-45	120	6	3⅛x5	230.1	Teet.-Hart..	L...	Helical	Pump..	Splash-Pr.	Gear.....	Tillotson..	Vacuum...	Single...	Delco.....	Hand..	Delco.....	6	Borg & Beck	Plate..
Porter.....45	142	4	4⅜x6¾	448.7	Own.....	I...	Worm..	Pump..	Splash-Pr.	Piston....	Zenith....	Pressure...	Double..	Berling....	Hand..	Westinghouse	12	Hele-Shaw...	Plate..
Premier.....6-D	126¾	6	3⅜x5½	295.3	Own.....	I...	Helical	Pump..	Splash-Pr.	Gear.....	Johnson..	Vacuum...	Single...	Delco.....	Atmtc..	Delco.....	6	Borg & Beck	Plate..
Reo.....T-6	120	6	3 3/16x5	239.4	Own.....	F...	Helical	Pump..	Circ-Spl..	Eccentric.	Rayfield...	Vacuum...	Dual....	Northeast..	Hand..	Northeast....	6	Own.....	Plate..
Revere.....C	131	4	4⅜x6	360.8	.....	....	Chain..	Pump..	Splash-Pr.	Gear.....	Stromberg.	Vacuum...	Single...	Bosch.....	Hand..	Westinghouse	6	Brown-Lipe..	Disk..
Roamer.....6-54	128	6	3½x5¼	303.1	Continental.	I...	Helical	Pump..	Splash-Pr.	Piston....	Stromberg.	Vacuum...	Single...	Bosch.....	Hand..	Bijur.....	6	Borg & Beck	.....
Scripps-Booth.....B	115	6	2 11/16x4¾	177.0	Northway..	I...	Helical	Pump..	Splash-Pr.	Gear.....	Marvel....	Vacuum...	Single...	.....	Hand..	Remy.....	6	Northway...	Cone..
Seneca.....L	108	4	3⅛x4½	138.1	LeRoi.....	L...	Spur...	Ther...	.....	.....	Schebler...	Vacuum...	Single...	.....	Hand..	Allis-Chal...	6	Borg & Beck	Plate..
Singer.....20	138	12	2⅞x5	389.5	Weidely....	I...	Helical	Pump..	Pressure..	Gear.....	Stromberg.	Vacuum...	Single...	Philbrin...	Hand..	Westinghouse	6	Covert.....	Disk..
Spacke.....S-20	90	2	3½x3⅜	69.3	Own.....	F...	Helical	Air....	Non-Circ.	Piston....	Carter....	Gravity...	Single...	.....	Hand..	.....	6	Own.....	Fric...
Standard.....1	127	8	3¼x5	331.8	Own.....	L...	Helical	Pump..	Pressure..	Gear.....	Zenith.....	Vacuum...	Double..	At Kent...	Hand..	Westinghouse	6	Borg & Beck	Plate..
Stearns.....SKL4	125	4	3⅜x5⅝	248.5	Own.....	K...	Chain..	Pump..	Pressure..	Gear.....	Schebler...	Vacuum...	Single...	At Kent...	Hand..	Westinghouse	12	Own.....	Disk..
Stephens.....80	122	6	3¼x4½	224.0	Own.....	I...	Helical	Ther...	Pressure..	Gear.....	Tillotson..	Vacuum...	Single...	Auto-Lite..	Hand..	Auto-Lite....	6	Borg & Beck	Plate..
Studebaker.....EJ	112	6	3⅛x4½	207.1	Own.....	L...	Chain	Pump..	Splash-Pr.	Gear.....	Stromberg.	Vacuum...	Single...	Wagner...	.....	Wagner.....	6	Own.....	Plate..
Studebaker.....EH	119	6	3½x5	288.6	Own.....	L...	Helical	Pump..	Splash-Pr.	Gear.....	Stromberg.	Vacuum...	Single...	Wagner...	Hand..	Wagner.....	6	Own.....	Cone..
Studebaker.....EG	126	6	3⅞x5	353.8	Own.....	L...	Helical	Pump..	Splash-Pr.	Gear.....	Ball.....	Vacuum...	Single...	Wagner...	Hand..	Wagner.....	6	Own.....	Cone..
Stutz.....H	130	4	4⅜x6	360.8	Own.....	T...	Helical	Pump..	Pressure..	Gear.....	Stromberg.	Pressure...	.....	Delco.....	Hand..	Remy.....	6	Own.....	Cone..
Templar.....445	118	4	3⅜x5½	196.8	Own.....	I...	Chain..	Pump..	Pressure..	Gear.....	Stromberg.	Vacuum...	Single...	Simms....	Hand..	Bijur.....	6	Borg & Beck	Plate..
Tulsa.....E	117½	4	3½x5	192.4	Hersh-Sp...	....	Helical	Ther...	Circ-Spl..	Gear.....	.....	.....	Single...	.....	Hand..	Dyneto.....	6	Borg & Beck	Plate..
Velie.....34	112	6	3⅛x4¼	195.6	Falls.....	I...	Helical	Ther...	Splash-Pr.	Piston....	Rayfield...	Vacuum...	Single...	At Kent...	H. & A.	Westinghouse	6	Borg & Beck	Plate..
Velie.....48	115	6	3¼x4½	224.0	Continental.	L...	Helical	Pump..	Pressure..	Gear.....	Rayfield...	Vacuum...	Single...	At Kent...	H. & A.	Bijur.....	6	Borg & Beck	Plate..
Westcott.....C-38	118	6	3¼x4½	224.0	Continental.	L...	Helical	Pump..	Splash-Pr.	Gear.....	Rayfield...	Vacuum...	Single...	Delco.....	H. & A.	Delco.....	6	Borg & Beck	Plate..
Westcott.....C-48	125	6	3½x5¼	303.1	Continental.	L...	Helical	Pump..	Splash-Pr.	Gear.....	Rayfield...	Vacuum...	Single...	Delco.....	H. & A.	Delco.....	6	Borg & Beck	Plate..
Winton.....25	132	6	3¾x5¼	347.9	Own.....	L...	Chain..	Pump..	Pressure..	Gear.....	Stromberg.	Vacuum...	Single...	Bosch.....	Hand..	Bijur.....	6	Own.....	Disk..

ABBREVIATIONS

2-pt—Two Point
¾ Ell—¾ Elliptic
¾ Float—¾ Floating
Amid—Amidships
Atmtc—Automatic
B & P—Ball and Plain
B & R—Ball and Roller
B R & P—Ball, Roller and Plain
Cant—Cantilever
Circ-Spl—Circulating Splash
Dual-D—Dual Double
Ell—Elliptic
F—1 Valve in Head, 1 in Side
Float—Floating
Fric—Friction
Gear—Gear Pump
H & A—Hand and Automatic
I—I-Head
K—Knight Type
L—L-Head
Mag—Magnetic
Non-Cir—Non-Circulating Splash
Opt—Optional
Plat—Platform

Passenger Cars for 1920 and Their Technical Specifications

The cars in this list were received too late for classification in the regular specification tables

Name and Model	Seating Capacity	Wheelbase	Rear Tire Size	Bore and Stroke	Engine Make	No. Cylinders	N. A. C. C. HP.	Carbureter Make and Size	Clutch	Gearset	Rear Axle	Steering Gear	Battery Volts	Battery Amp.	Battery Make	Generator Make	Motor Make	Ignition Make	Lamp Voltages
Argonne.....	4	128	32x4	3¾x5⅛	Own	4	22.50	—Ray.	.....	.....	.....	.....	12	.....	Exide	West.	Own	Eise.	12
Beggs 6.....	5	120	33x4	3¼x4½	Cont.	6	25.35	1—Strom.	B. and B.	Detroit	Timken	Ditweiler	6	100	Willard	A-L	A-L	Conn.	6
Bell.....	5	114	31x4	3⅜x4¼	G. B. & S.	4	22.50	1—Strom.	.....	Muncie	Peru	Warner	6	.....	Prest.	A-L	.....	A-K	6
Bour-Davis, 21 S.&R.	7	126	33x4½	3½x5¼	Cont.	6	29.40	1¼—Zen.	Muncie	Muncie	Salisbury	C. A. S.	6	115	Willard	West.	West.	West.	6
Cameron 55.....	5	118	32x4	3 x4½	Own	6	20.65	1—Own	B. and B.	Own	Own	.....	6	100	Exide	Bijur	Bijur	Conn.	6
Champion C-4.....	5	116	32x3½	3½x5	Lyco.	4	19.60	1—Zen.	B. and B.	G-L	Peru	C. A. S.	6	.....	Willard	Delco	Delco	Delco	6
Champion S-4.....	5	118	32x4	3½x5	H-S	4	19.60	1—Carter	B. and B.	G-L	Peru	C. A. S.	6	.....	Prest.	Dyn.	Dyn.	A-K	6
DuPont A.....	5	124	32x4½	3 11/16x5⅛	Own	4	24.75	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Ferris.....	6	130	32x4½	3½x5¼	.....	6	29.40	—Zen.	B. and B	.....	Col.	.....	.....	.....	.....	.....	.....	.....	.....
Gardiner.....	5	112	32x3½	3⅛x5	Own	4	19.60	1—Carter	B. and B.	Mechanics	W-Weiss	Ditweiler	6	87	Willard	West.	West.	West.	15
Geronimo.....	5	122	32x4	3⅛x5	Ruten.	6	23.44	1—Strom.	B. and B.	G-L	Flint	C. A. S.	6	88	Willard	Dyn.	Dyn.	Delco	6

Engine—Cont., Continental; G. B. & S., Golden, Belknap & Swartz; H-S., Herschell-Spillman; Lyco., Lycoming; Weid., Weidely. **Carbureter**—Ray., Rayfield; Strom., Stromberg; Zen., Zenith. **Clutch**—B. and B., Borg and Beck; B-L., Brown-Lipe. **Gearset**—G-L., Grant-Lees; B-L., Brown-Lipe. **Rear Axle**—Col., Columbia; W-Weiss, Walker-Weiss. **Generator and Motor**—A-L., Auto-Lite; Dyn., Dyneto. **Ignition**—A-K., Atwater-Kent; Conn., Connecticut; West., Westinghouse.

Their Technical Specifications—Continued.

TRANSMISSION							Gear Ratio on Direct	RUNNING GEAR				Make of Steering Gear	Make of Speedometer	Crankshaft Bearings and No.	BEARINGS			MAKE AND MODEL
GEARSET			Final Drive	Torque Taken By	Make of Rear Axle	Rear Axle Type		TIRES		Wheels	Rear Springs				Gear Set	Rear Axle	Front Wheel	
Make	Location	Speeds						Front	Rear									
Own	Amid	4	Sp.B	Springs	Own	Semi	3.53	35x5	35x5	Wood	¾-Ell	Own	Waltham	Plain 7	Ball	B.&R.	Roller	Pierce-Arrow 51
Muncie	Unit E	3	Sp.B	Springs	Spacke	¾ Float	4.90	32x4	32x4	Opt	Cant	Ditweiler	Stewart	Plain 3	Ball	B.&R.	Roller	Pilot 6-45
Own	Amid	4	Bevel	Springs	Own	Float	3.00	35x5	35x5	Wood	S-E	Own	Stewart	Plain 3	Ball	Ball	Ball	Porter 45
Own	Unit E	3	Sp.B	Springs	Stanpar	Semi-F	4.50	32x4½	32x4½	Wood	S-E	Opt	Stewart	Plain 3	B.R.P.	Roller	Roller	Premier 6-D
Own	Amid	3	Sp.B	Springs	Own	Semi-F	4.66	33x4	33x4	Wood	S-E	Own		Plain 4	Roller	Roller	Roller	Reo T-6
Brown-Lipe	Unit E	4	Sp.B	Tor-A	Stanpar	Float	3.44	32x4½	32x4½	Wire	Ell	Gemmer		Plain 2	Roller	Roller	Roller	Revere C
Grant-Lees	Unit E	3	Sp.B	Tor-A	Stanpar	¾ Float		32x4	32x4	Wire	S-E	Jacox	Stewart	Plain 3	Ball	Roller	Roller	Roamer 6-54
Warner	Unit E	3	Bevel	Springs	West-M	Float	4.50	32x4	32x4	Wood	S-E	Jacox	Stewart	Plain 3	Plain	B.&R.	Ball	Scripps-Booth B
Borg & Beck	Unit E	3	Bevel	Springs	Peru	Float	4.50	30x3	30x3	Opt	Cant	Ditweiler		Plain	B.&F.	B.&R.	Roller	Seneca L
Covert	Unit E	3	Sp.B	Springs	Timken	Float	3.77	33x5	33x5	Wire	Cant	Ross	Stewart	Plain 3	B.&P.	Roller	Roller	Singer 20
Own	Amid	2	Bevel	Springs	Own	Live	5.09	28x3	28x3	Wire	Cant	Own		Ball 2	Ball	Ball	Ball	Spacke S-20
Grant-Lees	Unit E	3	Sp.B	Springs	Timken	Semi-F	4.45	34x4½	34x4½	Wood	S-E	Gemmer	Stewart	Plain 3	Ball	Roller	Roller	Standard I
Own	Unit E	3	Sp.B	Springs	Own	Semi-F	4.50	34x4½	34x4½	Wood	Cant	Own	VanSicklen	Plain 3	B.&R.	B.&R.	Roller	Stearns SKL4
Mechanics	Unit E	3	Sp.B	Springs	Stanpar	Semi-F	4.75	33x4½	33x4½	Wood	S-E	C.A.S.	Stewart	Plain 3	B.&P.	Roller	Roller	Stephens 80
Own	Amid	3	Sp.B	Springs	Own	Semi-F	4.55	32x4	32x4	Wood	S-E	Own	VanSicklen	Plain 4	Roller	Roller	Roller	Studebaker EJ
Own	Amid	3	Sp.B	Springs	Own	Semi-F	4.33	32x4	32x4	Wood	S-E	Own	VanSicklen	Plain 4	Roller	Roller	Roller	Studebaker EH
Own	Amid	3	Sp.B	Springs	Own	Semi-F	3.70	33x4½	33x4½	Wood	S-E	Own	VanSicklen	Plain 4	Roller	Roller	Roller	Studebaker EG
Own	Unit A	3	Sp.B	Tor-A	Own	Semi-F	3.50	32x4½	32x4½	Wire	S-E	Gemmer	Stewart	Plain 3	Ball	B.&R.	Roller	Stutz H
Detroit	Unit E	3	Sp.B	Springs	American	Semi-F	4.40	33x4	32x4	Wood	S-E	C.A.S.	Stewart	Plain 3	Ball	B.&R.	Roller	Templar 445
Muncie		3	Bevel		Salisbury	¾ Float	4.50	33x4	33x4	Wood	S-E	C.A.S.	Stewart	Plain 2		B.&R.	Roller	Tulsa E
Durston	Unit E	3	Sp.B	Springs	Columbia	¾ Float	4.60	32x3½	32x3½	Wood	S-E	Gemmer	VanSicklen	Plain 3	Ball	Roller	Roller	Velie 34
Durston	Unit E	3	Sp.B	Springs	Timken	¾ Float	4.66	32x4	32x4	Wood	¾-Ell	Gemmer	VanSicklen	Plain	Ball	Roller	Roller	Velie 48
Warner	Unit E	3	Sp.B	Springs	Timken	Semi-F	5.09	33x4	33x4	Wood	S-E	Gemmer	VanSicklen	Plain 4	B.&R.	Roller	Roller	Westcott C-38
Brown-Lipe	Unit E	3	Sp.B	Springs	Timken	Semi-F	4.45	32x4½	32x4½	Wood	S-E	Gemmer	VanSicklen	Plain 3	B.&R.	Roller	Roller	Westcott C-48
Own	Unit E	3	Sp.B	Springs		Float	4.90	35x5	35x5	Opt	S-E		Stewart	Plain 4	B.&R.	Roller	Roller	Winton 25

Rad-Rd—Radius Rods
S-E—Semi-Elliptic
Semi-F—Semi-Floating
Sp.B—Spiral Bevel
Splash-Prs—Splash Pressure
Spur—Spur Gears
T—T-Head
Ther—Thermo-Syphon
Tor-A—Torsion Arm
Tor-T—Torsion Tube
Trans—Transverse
Unit-E—Unit with Engine
Unit-T—Unit with Torque Tube
Unit-A—Unit with Axle
EQUIPMENT
At Kent—Atwater Kent
G. & D.—Gray & Davis
Hersh-Sp—Herschell-Spillman
Johns-Man—Johns-Manville
Leece-N—Leece-Neville
Teet-Hart—Teetor-Hartley
Ward-L—Ward Leonard
West-M—Weston-Mott

Passenger Cars for 1920 and Their Technical Specifications

The cars in this list were received too late for classification in the regular specification tables

Name and Model	Seating Capacity	Wheelbase	Rear Tire Size	Bore and Stroke	Engine Make	No. Cylinders	N. A. C. C. H.P.	Carbureter Make and Size	Clutch	Gearset	Rear Axle	Steering Gear	Battery Volts	Battery Amp.	Battery Make	Generator Make	Motor Make	Ignition Make	Lamp Voltages
Hanson 54	5	119	32x4	3¼x4½	Cont.	6	25.35	—Strom.	B. and B.	Covert	Timken	Gemmer	6	80	Prest.	A-L	A-L	Remy	6-8
Hatfield A-42	5	115	32x4	3¼x5	H-S	4	16.90	1—Zen.	B. and B.	G-L	Col.		6		Willard	Dyn.	Dyn.	Conn.	6
H. C. S. Special	4	120	32x4½	3⅝x5½	Weid.	4	21.03												
Huffman, W	5	120	32x4	3¼x4½	Cont.	6	25.35	—Scheb.	B. and B.	Covert	Salisbury	Ditweiler	12	90	Willard	Dyn.	Dyn.	Conn.	6
Jackson	5	121	32x4	3¼x4½	Cont	6	25.35	1¼—Strom.	B. and B.	Covert	Salisbury	Own	6	94	W. S. L.	A-L	A-L	Remy	6
Lafayette	7	132	33x5	3¼x5¼	Own	8	33.80	1½—Own	Own	Own	Own	Own	6		Exide	Delco	Delco	Delco	6-8
Leach	5	126½	32x4½	3½x5¼	Cont.	6	29.40		B-L	B-L					Prest.				
Marshall K	5	118	32x3½	3½x5	Lyco.	4	19.60	1—Zen.	B. and B.	G-L	Peru	Gemmer	6	160	Willard	Dyn.	Dyn.	Delco	6
Ogren 6-60	6	134	33x5	3¾x5½	Conn.	6	33.75	1½—Opt.	B-L	B-L	Timken	Own	6	120	Willard	West.	West.	Bosch	6
Skelton	5	112	32x3½	3½x5	Lyco.	4	19.60	1—Carter	B. and B.	Muncie	Peru	C. A. S.	6	85	Prest	West.	West.	Conn.	6
Winther 61	5	119½	33x4	3¼x5	H-S	6	25.35	1¼—Strom.	Warner	Warner	Spacke	Lavine	6		Willard	West.	West.	West.	6

Engine—Cont., Continental; G. B. & S., Golden, Belknap & Swarts; H-S., Herschell-Spillman; Lyco., Lycoming; Weid., Weidely. **Carburetor**—Ray, Rayfield; Strom., Stromberg; Zen., Zenith. **Clutch**—B. and B., Borg and Beck; B-L., Brown-Lipe. **Gearset**—G-L., Grant-Lees; B-L., Brown-Lipe. **Rear Axle**—Col., Columbia; W-Weiss, Walker-Weiss. **Generator and Motor**—A-L., Auto-Lite; Dyn., Dyneto. **Ignition**—A-K., Atwater-Kent; Conn., Connecticut; West., Westinghouse.

Buyers' Guide to 1920 Gasoline Trucks

Classified According to Load Capacity and Combined With Salient Features of Chassis Design

TRUCKS OF UNDER ½-TON CAPACITY

Name and Model	Chassis Price	Wheel-base, Inches	Tires	N.A.C.C. Horse-power	Elec-tric System	Gear-set Type	Final Drive
Pony	$320	90	pneu	12.0	none	fric	chain

TRUCKS OF ½-TON CAPACITY

Name and Model	Chassis Price	Wheel-base, Inches	Tires	N.A.C.C. Horse-power	Elec-tric System	Gear-set Type	Final Drive
Champion	$1,000	114	pneu	16.9	lighting	selec	bevel
Elmira C	500	104	pneu	15.6	lighting	prog	int-gear
Loyal	950	110	pneu	15.6	s,l&i-2	selec	int-gear
Seneca F-2	1,060	108	pneu	15.6	s,l&i	selec	bevel
Vim 21	1,095	108	pneu	14.4	lighting	selec	bevel
Vim 26 Special	1,350	127	pneu	14.4	lighting	selec	bevel

TRUCKS OF ¾-TON CAPACITY

Name and Model	Chassis Price	Wheel-base, Inches	Tires	N.A.C.C. Horse-power	Elec-tric System	Gear-set Type	Final Drive
Belmont AA	$1,150	114	pneu	19.6	s,l&i-2	selec	int-gear
Conestoga 12	.....	124	pneu	19.6	s&l	selec	int-gear
Economy T-LHD	1,250	128	pneu	21.0	s,l&i	selec	int-gear
G. M. C 16	1,495	132	pneu	22.5	s,l&i-2	selec	bevel
Kearns H	1,350	118	pneu	16.9	s&l-2	selec	int-gear
Kissel Gen. Delivery	1 875	135	pneu	24.2	none	selec	bevel
Loyal Special	1,245	120	pneu	16.9	s,l&i-2	selec	int-gear
Old Hickory M	995	112	pneu	16.9	s,l&i	selec	bevel
Rainier R4-11	1,750	125	pneu	19.6	opt	selec	worm
Reo F	1,285	128	pneu	27.2	s,l&i-2	selec	bevel
Stewart 11	1,195	110	pneu	15.6	s,l&i-2	selec	int-gear
White 15	2,400	133½	pneu	22.5	.....	selec	bevel

TRUCKS OF 1-TON CAPACITY

Name and Model	Chassis Price	Wheel-base, Inches	Tires	N.A.C.C. Horse-power	Elec-tric System	Gear-set Type	Final Drive
Acason R	$2,400	142	solid*	22.5	none	selec	worm
Acme B	2,075	130	solid	22.5	lighting	ind-c	worm
All-American A	1,595	130	p&s	16.9	s&l	selec	int-gear
Apex C	1,395	130	p&s	19.6	s*,l&i	selec	int-gear

TRUCKS OF 1-TON CAPACITY

Name and Model	Chassis Price	Wheel-base, Inches	Tires	N.A.C.C. Horse-power	Elec-tric System	Gear-set Type	Final Drive
Beck A	$1,750	132	solid	19.6	lighting-2	selec	int-gear
Bessemer G	1,600	124	solid*	19.6	opt	selec	int-gear
Briscoe T-34	1,485	121	pneu	18.2	s,l&i-2	selec	int-gear
Clydesdale 32	.....	144	solid	22.5	.....	selec	worm
Collier 18	.....	140	solid	19.6	.....	.....	worm
Columbia F	1,750	126	solid	22.5	none	selec	int-gear
Commerce E	1,590	126	solid*	22.5	s&l	selec	int-gear
Conestoga 20	2,100	128	solid	19.6	.....	selec	worm
Corbitt E	2,250	130	solid	22.5	none	selec	worm
Dart E	.....	130	solid	22.5	s&l*	selec	worm
Day-Elder A	1,925	128	solid	22.5	s&l	selec	worm
Denby 12	1,950	124	pneu	19.6	.....	.....	int-gear
Douglas C	1,600	120	pneu	22.0	.....	selec	int-gear
Famous B1C	1,690	120	solid*	19.6	lighting	selec	int-gear
Federal SD	2,300	132	pneu	22.5	lighting*	selec	worm
Ford TT	550	124	p&s	22.5	lighting	plan	worm
Fulton A	.....	130	pneu	19.6	s&l	.....	int-gear
Gabriel C	2,000	136	pneu	29.0	s&l-2	selec	worm
Gary F	1,900	130	solid	16.9	.....	selec	worm
Giant 15	1,950	138	solid*	22.5	.....	selec	worm
Hal-Fur D	2,000	136	pneu	25.6	s,l&i	selec	worm
Independent F	1,685	128	solid*	19.6	lighting	selec	worm
I. H. C F	1,850	128	solid	19.6	s&l*	selec	int-gear
Kleiber AA	2,400	130	opt	22.5	none	selec	worm
Loyal	1,500	130	pneu	16.9	s,l&i-2	selec	int-gear
Moreland 19-N	.....	126	pneu	22.5	lighting	selec	worm
Napoleon 9	1,385	132	pneu*	19.6	lighting	selec	int-gear
Nash 2018	1,650	130	solid*	22.5	s&l-2	selec	int-gear
Noble A-20	.....	144	solid*	22.5	s&l-2	selec	worm
Old Hickory W	2,175	135	solid*	22.5	none	selec	worm
Oneida A	2,290	144	solid	22.5	starter*	.....	worm
Rainier R-9	1,875	125	solid	19.6	opt	selec	worm
Republic 10	1,595	124	solid*	22.5	s&l-2	selec	int-gear
Sandow C	1,895	120	solid*	19.6	lighting	selec	worm
Service 220	.....	137	solid	19.6	s&l-2	selec	worm
Signal F	2,650	146	solid	27.2	lighting-2	selec	worm
Southern A	1,495	.....	solid*	19.6	.....	.....	.....
Standard 56	2,250	134	solid	22.5	.....	selec	worm
Stewart 8	1,650	130	solid	19.6	lighting-2	selec	int-gear
Transport 20	1,750	130	.....	22.5	.....	.....	int-gear
Vim 25	2,195	125	solid*	22.5	none	selec	worm
Wilcox A-1	.....	130	pneu*	22.5	lighting	selec	worm
Witt Will N	2,000	120	solid	22.5	none	selec	worm

ABBREVIATIONS—Types of Construction

*—with other options
dbl-red—double reduction drive
4—driving on all four wheels
fric—friction
ind-c—individual clutch, constant mesh
int-gear—internal gear
plan—planetary
pneu—pneumatic
p & s—pneumatic and solid
prog—progressive
selec—selective sliding gearset
s, l & i—starting, lighting and ignition
s, l & i-2—2-unit starting, lighting and ignition system
s & l-2—2-unit starting and lighting system

TRUCKS OF 1½-TON CAPACITY

Name and Model	Chassis Price	Wheel-base, Inches	Tires	N.A.C.C. Horse-power	Elec-tric System	Gear-set Type	Final Drive
Acason.....RB	$3,150	142	solid*...	22.5	none....	selec..	worm
Ace.....A	.....	144	solid....	22.5	s,l&i-2...	selec..	worm
Air-O-Flex.....C	.....	160	solid....	22.5	s,l&i-2...	selec..	int-gear
Apex.....D	1,595	130	solid....	19.6	s&l.....	selec..	int-gear
Beck.....B	1,950	144	solid*...	22.5	lighting-2	selec..	int-gear
Belmont.....BB	1,950	144	p&s.....	22.5	lighting..	selec..	int-gear
Bessemer.....H-2	2,085	144	solid*...	22.5	opt.....	selec..	int-gear
Bethlehem.....D	2,095	136	solid....	25.6	s&l-2....	selec..	int-gear
Brockway.....S	2,100	140	solid....	22.5	s,l&i-2...	selec..	worm
Clydesdale.....42	2,445	146	solid*...	22.5	.....	selec..	worm
Collier.....19	.....	144	solid....	22.5	.....	.....	worm
Commerce.....EP	1,965	134	pneu....	22.5	s&l.....	selec..	int-gear
Concord.....A	2,350	140	solid....	22.5	.....	selec..	worm
Corbitt.....D	2,600	130	solid....	22.5	none....	selec..	worm
Day-Elder.....B	2,200	144	solid....	22.5	s&l.....	selec..	worm
Dearborn.....F	1,980	126	solid*...	19.6	.....	.....	worm
Defiance.....D	.....	140	pneu....	22.5	s&l-2....	selec..	int-gear
Diamond-T.....T	2,220	144	solid....	22.5	.....	selec..	worm
Diamond-T.....FS	2,445	144	solid....	22.5	.....	selec	worm
Diamond-T.....J-4	2,755	154	solid....	22.5	.....	selec..	worm
Erie.....	.....	144	solid....	27.2	.....	opt...	worm
Federal.....TE	2,500	144	solid....	27.2	.....	selec..	worm
Forschler.....AX	2,375	120	opt.....	19.6	.....	selec..	worm
Garford.....25	2,090	135	solid....	22.5	s,l&i....	selec..	worm
Gary.....CT	2,250	144	solid....	25.6	.....	selec..	worm
G. M. C.....21	2,395	130	solid....	22.5	lighting-2	selec..	worm
Giant.....14	.....	144	solid*...	22.5	.....	selec..	worm
Gramm-Bernstein....15	.....	138	solid*...	22.5	.....	selec..	int-gear
Grant.....10	1,885	124	pneu*...	22.5	s,l&i-2...	selec..	int-gear
Grant.....11	1,935	140	pneu*...	22.5	s,l&i-2...	selec..	int-gear
Harvey.....WEA	2,350	128	solid....	27.2	.....	selec..	worm
Hawkeye.....K	1,995	148½	solid*...	22.5	.....	selec..	int-gear
Huffman.....B	1,895	140	solid*...	16.9	.....	selec..	worm
Huffman.....C	1,695	140	solid*...	16.9	.....	selec..	int-gear
Hurlburt.....	2,850	148	solid....	25.6	.....	selec..	worm
Independent.....E	1,890	135	solid*...	22.5	none....	selec..	int-gear
Indiana.....12	2,300	134	solid*...	22.5	s&l*....	selec..	worm
Inland.....C	1,950	136	p&s.....	22.5	s&l-2....	selec..	int-gear
I. H. C.....K	2,200	128	solid....	19.6	s&l*....	selec..	int-gear
Kearns.....N	2,000	136	solid....	19.6	s&l-2....	selec..	int-gear
Kelly-Springfield.....K	3,000	144	solid....	22.5	s,l&i-2*...	selec..	chain
Kelly-Springfield..KS-32	3,000	144	solid....	22.5	s,l&i-2*...	selec..	worm
Kissel.....(Gen. Utility)	2,275	152	solid....	24.2	none....	selec..	worm
Kleiber.....A	2,800	143	solid....	27.2	none....	selec..	worm
Koehler.....C	1,885	131	solid....	19.6	s&l-2....	selec..	int-gear
Larrabee.....U	2,250	138	solid....	22.5	lighting..	selec..	worm
Maccar.....L	2,750	150	solid....	27.2	opt.....	selec..	worm
Mack.....AB	3,000	144	solid*...	25.6	light.-2*..	selec..	worm
Mack.....AB	3,000	144	solid*...	25.6	light.-2*..	selec..	worm
Master.....JW	2,290	142	soid....	27.2	s&l*....	selec..	worm
Master.....JI	2,190	142	solid....	27.2	s&l*....	selec..	int-gear
Maxwell.....	1,185	124	solid*...	21.1	lighting..	selec..	worm
Moreland.....19B	2,930	126	solid....	27.2	lighting..	selec..	worm
Napoleon.....11	1,660	132	pneu*...	19.6	lighting..	selec..	int-gear
Nash.....3018	2,250	144	solid*...	22.5	s&l-2....	selec..	int-gear
Nelson & LeMoon.....F	.....	opt	solid*...	27.2	s&l-2*...	selec..	worm
Noble.....B-30	.....	144	solid*...	22.5	s&l-2....	selec..	worm
Old Reliable.....A	2,350	138	solid....	25.6	lighting..	selec..	worm
Oneida.....B	2,650	144	solid....	27.2	starting*	.....	worm
Packard.....E	3,200	144	solid....	25.6	s&l-2....	selec..	worm
Rainier.....R6	1,975	133	solid....	19.6	opt.....	selec..	worm
Republic.....11	1,885	144	solid*...	22.5	s&l-2....	selec..	int-gear
Rock Falls.....9	.....	150	pneu....	29.5	s&l-2....	prog..	bevel
Sandow.....CG	2,090	135	solid*...	22.5	.....	selec..	worm
Sandow.....I	.....	150	solid*...	22.5	.....	selec..	int-gear
Schwartz.....B	2,175	140	solid*...	22.5	none....	selec..	int-gear
Selden.....	.....	137½	solid*...	22.5	s&l-2*...	selec..	worm
Service.....31	2,785	150	solid....	25.6	s&l*....	selec..	worm
Service.....36	3,215	150	pneu....	29.0	s&l-2*...	selec..	worm
Signal.....H	2,850	146	solid....	27.2	lighting-2	selec..	worm
Southern.....B	1,795	.....	solid*...	22.5	.....	.....	.....
Sterling.....	2,480	142	opt.....	25.6	s&l.....	ind-c..	worm
Stewart.....9	1,975	140	solid....	22.5	light-2*..	selec..	int-gear
Sullivan.....F	2,350	130	solid....	22.5	.....	selec..	worm
Tiffin.....GW	2,300	135	solid....	27.2	s,l&i....	selec	worm
Transport.....30	2,050	140	.....	22.5	.....	.....	int-gear
Triangle.....A	2,185	144	solid*...	22.5	none....	selec..	int-gear
United.....A	.....	145	solid....	22.5	lighting..	selec..	int-gear
U. S.....N	2,150	144	solid*...	22.5	s&l-2*...	prog..	int-gear

TRUCKS OF 1½-TON CAPACITY—Con.

Name and Model	Chassis Price	Wheel-base, Inches	Tires	N.A.C.C. Horse-power	Elec-tric System	Gear-set Type	Final Drive
Velie.....46	1,925	133	solid....	22.5	none....	selec..	int-gear
Victor.....A	1,950	140	solid*...	22.5	lighting..	prog..	int-gear
Wichita.....L	2,350	144	solid....	19.6	.....	.....	worm
Wilcox.....B	.....	144	solid....	29.0	lighting..	selec..	worm
Wilson.....	2,450	136	solid....	22.5	lighting..	selec..	worm
Winther-Marwin..430-A	.....	132	solid*...	22.5	s&l-2*...	selec..	int-gear
Winther.....39	.....	140	solid....	22.5	s&l-2*...	selec.	int-gear
Witt Will.....N Special	2,150	120	solid....	22.5	none....	selec..	worm
Wolverine.....C	.....	140	solid*...	22.5	s,l&i-2...	selec..	int-gear

TRUCKS OF 2-TON CAPACITY

Name and Model	Chassis Price	Wheel-base, Inches	Tires	N.A.C.C. Horse-power	Elec-tric System	Gear-set Type	Final Drive
Acme.....A	$2,850	148	solid....	22.7	lighting..	ind-c	worm
Armleder.....LW	2,900	156	solid....	27.2	none....	selec..	worm
Acto.....W-25	2,875	150	solid*...	29.0	none....	selec..	worm
Autocar.....21-UF	2,300	97	solid*...	18.1	none....	prog..	dbl-red
Autocar.....21-UG	2,400	120	solid....	18.1	none....	prog..	dbl-red
Available.....H-2	2,950	148	solid....	27.2	none....	selec..	worm
Beck.....C	2,350	144	solid*...	27.2	lighting-2	selec..	int-gear
Clydesdale.....65	.....	163	solid*...	27.2	.....	selec..	worm
Collier.....20	.....	152	solid....	27.2	.....	.....	worm
Conestoga.....30	2,700	138	solid....	22.5	.....	selec..	worm
Corbitt.....C	3,500	148	solid....	27.2	none....	selec..	worm
Dart.....CC4	.....	150	solid....	29.0	s&l*....	selec..	worm
Day-Elder.....D	2,600	144	solid....	27.2	s&l.....	selec..	worm
Dearborn.....BW	2,250	133	solid....	22.5	.....	selec..	worm
Denby.....134	2,450	144	solid....	22.5	.....	.....	int-gear
Defiance.....E	.....	140	pneu....	22.5	s&l-2....	selec..	int-gear
DeKalb.....E-2	2,250	134	solid*...	27.2	none....	selec..	worm
Diamond-T.....J-3	3,185	154	solid....	27.2	.....	selec..	worm
Erie.....	.....	150	solid....	27.2	.....	.....	worm
Federal.....UE	2,800	156	solid....	27.2	.....	selec..	worm
Forschler.....B	2,750	144	opt.....	27.2	.....	selec..	worm
Fulton.....C	2,350	137	solid....	16.9	none....	selec..	int-gear
Gabriel.....E	3,250	156	solid*...	29.0	s&l-2....	selec..	worm
Garford.....70-B	3,100	144	solid*...	29.0	s&l.....	selec..	worm
G. M. C.....41	2,725	144	solid....	27.2	lighting-2	selec..	worm
Giant.....16	2,850*	144*	solid*...	27.2	none....	selec..	worm
Gramm-Bernstein....20	.....	.....	solid*...	27.2	.....	.....	worm
Grant.....15	2,250	124	solid*...	22.5	s,l&i-2...	selec.	int-ge :
Grant.....16	2,250	140	pneu*...	22 5	s,l&i-2...	selec..	int-gea
Independent.....F	2,290	146	solid*...	27.2	none....	selec..	int-gear
Independent.....G	2,500	144	solid*...	27.2	lighting..	selec..	worm
Indiana.....20	2,950	150	solid*...	27.2	s&l-2*...	selec..	worm
Inland.....D	2,850	132	.....	25.6	none....	.....	int-gear
I. H. C.....G	2,600	138	solid....	25.6	s&l*....	selec..	int-gear
Keldon.....19	2,885	144	solid....	29.0	none....	selec..	int-gear
Keystone.....40	2,200	144	p&s*....	22.5	none....	selec..	int-gear
Kimball.....AB	3,675	144	opt.....	25.6	lighting..	selec.	worm
Kissel.....Freighter	2,975	168	solid*...	29.0	none....	selec..	worm
Kleiber.....BB	3,200	153	solid....	27.2	none....	selec..	worm
Lange.....B	2,950	136	solid....	27.2	none....	ind-c..	chain
Mack.....AB	3,300	Opt.	solid*...	25.6	s&l-2*...	selec..	chain
Mack.....AB	3,300	Opt.	solid*...	25.6	light.-2*..	selec..	worm
Master.....M	2,590	144	solid....	29 0	s&l*....	selec.	int-gear
Master.....W	2,890	144	solid....	29.0	s&l*....	selec..	worm
Muskegon.....20	2,325	144	solid....	27.2	none....	selec.	int-gear
Mutual.....2-A	3,375	150	solid*...	25.6	s&l.....	selec..	worm
Nash.....4017	3,250	124	solid*...	29.0	none....	selec..	int-gear
Nelson & LeMoon....F2	.....	opt.	solid....	27.2	s&l-2*...	selec..	worm
Netco.....D	3,200	144	solid*...	27.2	none....	selec..	worm
Niles.....E	2,800	140	solid....	27.2	none....	selec..	worm
Noble.....C-40	.....	148	solid*...	25.6	s&l-2....	selec..	worm
Northway.....B-2	3,250	146	solid....	25.6	s,l&i-2...	selec..	worm
Oneida.....C	3,000	144	solid....	27.2	starting*	.....	worm
Packard.....2-E	3,600	144	solid....	25.6	s&l-2....	selec..	worm
Parker.....F-9C	3,500	150	solid....	29.5	s&l-2....	selec.	worm
Parker.....F-9W	3,325	150	solid....	25.6	s&l-2....	selec..	worm
Pierce-Arrow.....X-4	4,300	150	solid*...	25.6	s,l&i-2...	selec..	worm
Pioneer All Steel.....F	2,790	144	solid....	27.2	none....	.....	worm
Power.....B	2,950	150	solid....	27.2	none....	selec..	worm
Rainier.....R-8	2,400	147	solid....	22.5	none....	selec..	worm
Rowe.....CDW	3,300	.....	solid....	25.6	none....	selec..	worm
Sandow.....I	1,895	150	solid....	22.5	.....	selec..	worm
Schacht.....	3,350	144	solid....	29.0	none....	selec..	worm
Signal.....J	3,200	150	solid....	27.2	lighting-2	selec..	worm
Standard.....76	2,800	140	solid....	27.2	.....	selec..	worm
Stewart.....7	2,575	156	solid....	27.2	lighting-2	selec..	int-gea
Sullivan.....E	2,975	150	solid....	27.2	.....	selec..	worm

TRUCKS OF 2-TON CAPACITY—Con.

Name and Model	Chassis Price	Wheel-base, Inches	Tires	N.A.C.C. Horse-power	Elec-tric System	Gear-set Type	Final Drive
Traffic C	$1,395	132	solid	22.5		selec	int-gear
Transport 50	2,585	150		27.2			int-gear
Victor B	2,225	140	solid	22.5	lighting	prog	int-gear*
Vim 22	3,150	142	solid	22.5	none	selec	worm
White 30	3,300	157½	solid*	22.5		selec	dbl-red
Wichita M	2,750	144	solid	22.5			worm
Winther 49-A		147	solid	25.0	s&l-2*	selec	int-gear

TRUCKS OF 2½-TON CAPACITY

Acason H	$4,150	150	solid	29.0	none	ind-c	worm
Ace A		156	solid*	29.0	s,l&i-2	selec	worm
Apex E	2,450	150	solid	29.0	s&l	selec	int-gear
Atterbury 7-CX		153½	solid	27.2	lighting	selec	worm
Available H	3,250	148	solid	27.2	none	selec	worm
Bessemer J-2	2,785	158	solid*	27.2	opt	selec	int-gear
Bethlehem EH	2,495	144	solid	25.6	s&l-2	selec	int-gear
Betz	2,700	150	solid	29.0	none	selec	worm
Brinton F	3,000	150	solid	27.2	none	selec	worm
Brockway K-4	2,950	152	solid	27.2	s,l&i-2	selec	worm
Clydesdale 65X	3,200	163	solid*	27.2		selec	worm
Columbia G	2,750	144	solid	25.6	s&l-2	selec	int-gear
Concord B	2,850	150	solid	29.0		selec	worm
Corbitt B	3,250	148	solid	27.2	none	selec	worm
Day-Elder C	2,850	150	solid	29.0	lighting	selec	worm
DeKalb E	2,600	136	solid*	27.2	none	selec	worm
Dorris K-4	3,285	144	solid*	29.0	s&l-2	selec	worm
Douglas E	2,525	136	solid*	29.0		selec	int-gear
Erie		150	solid	27.2			worm
Fageol	3,400	144	solid	29.0		prog	worm
Gary J	2,750	148	solid	29.0		selec	worm
Hal-Fur B	2,750	168	solid*	29.0	none	selec	worm
Harvey WFA	3,300	150	solid	29.0		selec	worm
Hawkeye M	2,650	148	solid*	29.0	lighting	selec	int-gear
Hulburt	3,750	170	solid	29.0		selec	worm
Indiana 25	3,150	156	solid*	27.2	s&2*	selec	worm
Kelly-Springfield K-35	3,500	144	solid	22.5	s,l&i-2	selec	chain
Kelly-Springfield KS-36	3,500	144	solid	22.5	s,l&i-2	selec	worm
Kimball AC	3,975	159	pneu*	29.0	lighting	selec	worm
Kleiber B	3,800	160	solid	32.4	none	selec	worm
Koehler M	3,165	162	solid	25.6	s&l-2	selec	worm
LaFrance 2-B		158	sal*	36.2	s&l-2	selec	worm
Larrabee C	3,250	152	solid	27.2	lighting	selec	worm
L. M. C. 2-20	2,950	164	solid	27.2	s,l&i-2	selec	int-gear
Maccar H	2,500	162	solid	32.4	opt	selec	worm
Moreland 19-C	3,775	144	solid	32.4	lighting	selec	worm
Mutual A		153	pneu	25.6	s&l		worm
Netco H	3,400	168	solid*	32.4	none	selec	worm
Noble D-50		162	solid	29.0	lighting	selec	worm
Old Reliable B	3,250	160	solid	29.0	lighting	selec	worm
Paige 50-18	3,150	150	solid*	27.2	none	selec	worm
Republic 19	2,395	144	solid*	27.2	s&l-2	selec	int-gear
Rowe CDW	3,300		solid	25.6	none	selec	worm
Sandow J	2,975	165	solid*	27.2		selec	worm
Sanford 25	3,000	156	solid	27.2	lighting	selec	worm
Schacht	3,650	156	solid	29.0	none	selec	worm
Schwartz C	2,675	146	solid	27.2	none	selec	int-gear
Selden A		145	solid	27.2	s&l-2	selec	worm
Service 51	3,245	160	solid	29.0	s&l-2	selec	worm
Sterling	3,475	156	opt	30.7	s&l-2	selec	worm
Tiffin MW	3,050	148	solid	27.2	s,l&i	selec	worm
Triangle B	2,850	151	solid*	27.2	none	selec	int-gear
Union F	2,675	152	solid*	25.6	lighting	selec	int-gear
United B		151	solid	29.0		selec	int-gear
U. S. H	3,250	144	solid*	27.2	lighting*	prog	worm
Walker-Johnson B	2,890	175	solid*	29.0	none	selec	worm
Wichita R	2,950	144	solid	22.5			worm
Wilcox C		150	solid	34.0	lighting	selec	worm
Wilson EA	3150	152	solid	27.2	lighting	selec	worm
Winther-Marwin 459		152	solid	25.6	s&l-2	selec*	int-gear
Witt Will P	2,950	140	solid	27.2	none	selec	worm

TRUCKS OF 3-TON CAPACITY

A & B 3-T		144	solid	42.8	none	elec	int-gear
Denby 25	3,250	150	solid	27.2	none		int-gear
Forschler BX	3,450	144	solid*	27.2		selec	worm
F. W. D. B	4,500	124	solid*	36.2	s&l	ind-c	bevel
Kimball AK	4,475	159	sol*	32.4	lighting	selec	worm
Packard 3-E	4,300	156	solid	32.4	s&l-2	selec	worm
Riker B	4,600	150	solid	29.0	s&l-2	selec	worm
Rowe DEW	3,900		solid	25.6	none	selec	worm
Rowe DGW	4,950	170	pneu	33.8	s,l&i	selec	worm
Vim 23	3,950	175	solid	28.9	none	selec	worm
White 40	4,300	174	solid	22.5		selec	int-gear
Winther 69		150	solid	25.6	s&l-2*	selec	int-gear

TRUCKS OF 3½-TON CAPACITY

Acason L	5,150	172	solid	29.0	none	ind-c	worm
Acme C	3,875	168	solid	32.4	lighting	ind-c	worm
All-Power SV-4	4,800	166	solid	32.4	s,l&i*	ind-c	worm
Armleder KW	3,850	186	solid	32.4	none	selec	worm
Atterbury 7-D		167½	solid	32.4	lighting	selec	worm
Available H-3½	4,200	156	solid	32.4	none	selec	worm
Bethlehem FJ	3,595	162	solid	32.4	s&l-2	selec	int-gear
Brockway R-2	3,900	164	solid	32.4	s,l&i	selec	worm
Clydesdale 90	4,075	180	solid	32.4		selec	worm
Corbitt A	4,200	178	solid	32.4	none	selec	worm
Day-Elder F	3,550	165	solid	32.4	lighting	selec	worm
Diamond-T LB	4,390	170	solid	32.4		selec	worm
Dorris K-7	4,200	154	solid*	29.0	s&l-2	selec	worm
Duplex E	4,000	130	solid	29.0	opt	selec	int-gear
Erie		168	solid	32.4			worm
Fageol	4,500	172	solid			selec	worm
Federal WD	3,650	156	solid	32.4		selec	worm
Gary KT	3,750	163	solid	32.4		selec	worm
G. M. C. 71	3,750	163	solid	32.4	lighting-2	selec	worm
Giant 17	3,850	176	solid	32.4		selec	worm
Gramm-Bernstein 35		156	opt		s,l&i	ind-c	worm
Harvey WHA	4,300	160	solid	32.4		selec	worm
Hulburt	4,400	156	solid	32.4		selec	worm
Indiana 35	3,750	160	solid*	30.6	s&l-2*	selec	worm
I. H. C. L		160	solid	29.0	s&l*	selec	int-gear
Jackson C-1920	4,250	150	solid	32.4	s,l&i-2	selec	bevel
Kelly-Springfield K-40	4,400	150	solid	32.4	s,l&i-2*	selec	chain
Kissel Heavy Duty	3,975	168	solid*	29.0	none	selec	worm
Kleiber C	4,400	163	solid	32.4	none	selec	worm
LaFrance 4-A		158	solid*	32.4	lighting	selec	worm
Larrabee A&B	4,000	154	solid	32.4	lighting	selec	worm
Maccar M	4,300	174	solid	32.4	opt	selec	worm
Mack AC	4,950	opt	solid	40.0	l-2*	selec	chain
Master A	3,990	158	solid	32.4	s&l*	selec	worm
Mutual 3½-A			solid	32.4	s&l		worm
Nelson & LeMoon F-3½		opt	solid	32.4	s&l-2*	selec	worm
Noble E-70		182	solid	32.4	lighting	selec	worm
Northway B-3½	4,250	160	solid	25.6	s,l&i-2	selec	worm
Old Reliable C	4,000	160	solid	29.0	lighting	selec	worm
Oneida D	3,700	160	solid	32.4			worm
Paige 51-18	4,150	160	solid*	32.4	none	selec	worm
Parker J-9	4,400	160	solid	32.4	s&l-2	selec	worm
Republic 20	3,595	165	solid*	32.4	lighting	selec	int-gear
Sandow M	3,975	175	solid	32.4		selec	worm
Sanford 35	3,975	174	solid	32.4	lighting	selec	worm
Schacht	4,150	168	solid	29.0	none	selec	worm
Selden A		162	solid	32.4	s&l-2*	selec	worm
Service 76	4,285	171	solid	32.4	s&l-2	selec	worm
Signal M	4,200	168	solid	32.4	lighting	selec	worm
Standard 66	4,200	160	solid	32.4		selec	worm
Sterling	4,550	162	solid	32.4	s&l-2	ind-c	worm
Stewart 10	3,500	165	solid	32.4	lighting-2	selec	int-gear
Sullivan H		170	solid	32.4		selec	worm
Tiffin PW	3,980	160	solid	32.4	s,l&i	selec	worm
Titan Transport	4,300	162	solid*	32.4	lighting	ind-c	int-gear

ABBREVIATIONS—Types of Construction

*—with other options
dbl-red—double reduction drive
4—driving on all four wheels

fric—friction
ind-c—individual clutch, constant mesh
int-gear—internal gear

plan—planetary
pneu—pneumatic
p & s—pneumatic and solid
prog—progressive

selec—selective sliding gearset
s, l & i—starting, lighting and ignition

s, l & l-2—2-unit starting, lighting and ignition system
s & l-2—2-unit starting and lighting system

TRUCKS OF 3½-TON CAPACITY—Con.

Name and Model	Chassis Price	Wheel-base, Inches	Tires	N.A.C.C. Horse-power	Elec-tric System	Gear-set Type	Final Drive
United.....O	.....	157	solid....	29.0	.....	selec..	int-gear
U. S.....J	$3,950	162	solid....	32.4	lighting..	prog..	worm
Velie.....26-B	3,900	174	solid....	32.4	none....	selec..	worm
Ware.....A	3,500	136	solid....	19.6	none....	ind-c..	bevel
Watson.....	.....	168	solid....	32.4	none....	selec..	worm
Wichita.....O	3,750	165	solid....	32.4	.....	.....	worm
Wilcox.....E	.....	162	solid....	29.0	lighting..	selec..	worm
Wilson.....G	3.950	160	solid....	32.4	lighting..	selec..	worm
Winther-Marwin....979	.....	168	pneu....	32.4	s&l-2*...	selec..	int-gear
Winther.....979	.....	168	pneu....	32.4	s&l-2*...	selec..	int-gear

TRUCKS OF 4-TON CAPACITY

Name and Model	Chassis Price	Wheel-base, Inches	Tires	N.A.C.C. Horse-power	Elec-tric System	Gear-set Type	Final Drive
Bessemer.....K-2	$3,985	175	solid....	32.4	opt.....	selec..	int-gear
Gabriel.....F	4,300	180	solid....	32.4	s&l-2....	selec..	worm
Highway-Knight.....A	4,800	159	solid*...	25.6	s,l&i-2...	selec..	worm
Kelly-Springfield..K-45.	4,510	150	solid....	32.4	s,l&i-2*..	selec..	chain
Kimball.....AE	4,975	170	solid....	36.2	lighting..	selec..	worm
Moreland.....19-G	4,875	162	solid....	36.2	lighting..	selec..	worm
Packard.....4-E	4,550	156	solid....	32.4	s&l-2....	selec..	worm
Riker.....BB	4,700	150	solid....	29.0	s&l-2....	selec..	worm
Union.....H	3,500	171	solid....	32.4	lighting..	selec..	int-gear
Winther.....89	.....	156	solid....	29.0	s&l*....	selec..	int-gear

TRUCKS OF 5-TON CAPACITY

Name and Model	Chassis Price	Wheel-base, Inches	Tires	N.A.C.C. Horse-power	Elec-tric System	Gear-set Type	Final Drive
A & B.....5-T	$2,100	144	solid....	42.8	none....	elec...	int-gear
Acason.....M	.....	187	solid....	36.2	.....	ind-c..	worm
Acme.....E	4,975	180	solid....	36.2	lighting..	ind-c..	worm
Atterbury.....8-E	.....	167½	solid....	36.2	s&l.....	selec..	worm
Autohorse.....10	2,100	43	solid....	22.5	none....	selec..	int-gear
Available.....H-5	4,900	168	solid....	36.2	none....	selec..	worm
Bollstrom.....A	.....	144	solid*...	29.0	.....	ind-c..	int-gear
Brockway.....T	5,000	172	solid....	36.2	none....	selec..	worm
Clydesdale.....120-B	5,025	176	solid....	36.1	.....	selec..	worm
Corbitt.....AA	5,000	178	solid....	36.2	none....	selec..	worm
Denby.....210	4,900	170	solid....	32.4	none....	.....	int-gear
Diamond-T.....R	5,190	170	solid....	32.4	.....	selec..	worm
Diamond-T.....S	5,660	180	solid....	36.2	.....	selec..	worm
Fageol.....	5,300	172	solid....	32.4	.....	selec..	worm
Federal.....XC	4,500	156	solid....	32.4	.....	selec..	worm
Garford.....68	5,000	128	solid....	36.2	lighting..	selec..	chain
Gary.....M	4,850	182	solid....	40.0	.....	selec..	worm
G. M. C.....101	4,350	163	solid....	32.4	lighting-2	selec..	worm
Gramm-Bernstein....50	.....	.....	solid*...	.....	.....	.....	worm
Harvey.....WKA	5,000	160	solid....	32.4	.....	selec..	worm
Highway-Knight.....B	5,600	159	solid....	25.6	s&l-2....	selec..	worm
Hurlburt.....	5,250	156	solid....	32.4	.....	selec..	worm
Indiana.....50	4,800	170	solid*...	16.3	s&l-2*...	selec..	worm
Kelly-Springfield...K-50	5,150	150	solid....	32.4	s,l&i-2*..	selec..	chain
Kimball.....AF	5,975	170	solid....	40.0	lighting..	selec..	worm
Kleiber.....D	5,300	180	solid....	44.2	none....	selec..	worm
Larrabee.....TG	4,900	178	solid....	32.4	lighting..	selec..	worm
Maccar.....G	5,250	186	solid....	36.2	opt.....	selec..	worm
Master.....B	4,990	170	solid....	36.2	lighting*	selec..	worm
Moreland.....19-V	5,350	192	solid....	36.2	lighting..	selec..	worm
Mutual.....A	.....	.....	solid....	40.0	s&l.....	.....	worm
Nelson & LeMoon. FC-5	.....	opt.	solid....	36.2	s&l-2*...	selec..	worm
Old Reliable.....D	5,000	166	solid....	41.6	lighting..	selec..	worm
Oneida.....E9	4,850	180	solid....	32.4	starting*	selec..	worm

TRUCKS OF 5-TON CAPACITY—Con.

Name and Model	Chassis Price	Wheel-base, Inches	Tires	N.A.C.C. Horse-power	Elec-tric System	Gear-set Type	Final Drive
Packard.....E	5,450	156	solid....	40.0	s&l-2....	selec..	worm
Parker.....M-9	5,500	160	solid....	36.2	s&l-2....	selec .	worm
Pierce-Arrow.....R-9	5,500	168	solid....	38.2	s,l&i....	selec..	worm
Rowe.....FW	5,390	.....	solid....	36.2	.....	selec..	worm
Sandow.....L	$4,750	175	solid....	32.4	.....	selec..	worm
Sanford.....50	4,750	174	solid....	32.4	lighting..	selec..	worm
Schecht.....	5,150	168	solid....	32.4	none....	selec..	worm
Schwartz.....D	4,500	170	solid....	32.4	lighting..	selec..	int-gear
Selden.....5-A	.....	164	solid....	36.1	s&l-2....	selec..	worm
Service.....101	5,145	171½	solid....	32.4	s&l-2....	selec..	worm
Signal.....R	5,300	180	solid....	36.2	lighting-2	selec..	worm
Standard.....86	5,000	160	solid....	32.4	none....	selec..	worm
Sterling.....W	5,350	168	solid....	40.0	s&l-2....	ind-c..	worm
Sterling.....C	5,600	174	solid....	40.0	s&l-2....	ind.-c.	chain
Tiffin.....TW	5,000	168	solid....	36.2	s,l&i....	selec..	worm
Titan.....	5,150	156	solid*...	32.4	lighting..	ind-c..	int-gear
United.....V	.....	160	solid....	32.4	.....	selec..	int-gear
U. S.....K	4,850	168	solid....	36.2	lighting..	ind-c..	worm
Walter.....S	.....	168	solid....	32.4	s&l-2....	selec..	dbl-red
White.....45	5,000	174	solid....	29.0	.....	selec..	dbl-red
Wilcox.....W	.....	162	solid....	36.2	lighting..	selec..	worm
Wilson.....H	4,800	160	solid....	32.4	lighting..	selec..	worm
Winther.....109	.....	162	solid....	36.2	lighting..	selec..	int-gear

TRUCKS OF 5½-TON CAPACITY

Name and Model	Chassis Price	Wheel-base, Inches	Tires	N.A.C.C. Horse-power	Elec-tric System	Gear-set Type	Final Drive
LaFrance.....5-A	.....	160	solid*...	40.0	s&l*....	selec..	worm
Mack.....AC	5,500	$168	solid....	40.0	light.-2*.	sclec..	chain

TRUCKS OF 6-TON CAPACITY

Name and Model	Chassis Price	Wheel-base, Inches	Tires	N.A.C.C. Horse-power	Elec-tric System	Gear-set Type	Final Drive
Garford.....69	$5,300	128	solid....	41.6	lighting..	selec..	chain
Kelly-Springfield...K-60	5,500	150	solid....	32.4	s,l&i-2*..	selec..	chain
Packard.....6-E	5,700	156	solid....	40.0	s&l-2....	selec..	worm
Tiffin.....UW	5,200	168	solid....	36.2	s,l&i....	selec..	worm
Wichita.....S	5,400	165	solid....	32.4	.....	.....	dbl-red
Winther.....129	.....	162	solid....	42.2	lighting..	selec..	int-gear

TRUCKS OF 7-TON CAPACITY

Name and Model	Chassis Price	Wheel-base, Inches	Tires	N.A.C.C. Horse-power	Elec-tric System	Gear-set Type	Final Drive
Winther.....148	.....	162	solid....	42.2	ligating..	selec..	int-gear

TRUCKS OF 7½-TON CAPACITY

Name and Model	Chassis Price	Wheel-base, Inches	Tires	N.A.C.C. Horse-power	Elec-tric System	Gear-set Type	Final Drive
Mack.....AC	$6,000	opt.	solid....	40.0	light.-2*.	selec..	chain
Old Reliable.....K	6,000	136	solid....	36.2	none....	selec..	chain
Sterling.....7½	6,000	174	solid....	4.00	s&l-2....	ind-c..	chain

ABBREVIATIONS—Types of construction.

"—with other options
dbl-red—double reduction drive
4—driving on all four wheels
fric—friction
ind-c—individual clutch, constant mesh
int-gear—internal gear
plan—planetary
pneu—pneumatic
p & s—pneumatic and solid
prog—progressive
selec—selective sliding gearset
s, l & i—starting, lighting and ignition
s, l & i-2—2-unit starting, lighting and ignition system
s & l-2—2-unit starting and lighting system

Detailed Technical Specifications

Details of 516 Gasoline and 22 Electric Chassis as Produced by Makes of Principal Truck Parts, Including Engines, Clutches, Electric and

Name and Model	Tons Capacity	Chassis Price	Wheelbase, Inches	FRAME			TIRES			WHEELS		ENGINE														
								Size in Ins.							COOLING					IGNITION			ELEC. SYSTEM		
																Radiator									
																CASE		CORE							
				Make	Material	Type	Kind	Front	Rear	Make	Type	Make	No. Cyl. Bore and Stroke—N.A.C.C. Hp.	Cylinders Cast	Water Circ.	Make	Type	Make	Type	Type	Make	Spark Advance	Type	Make	Extra Cost $
A. & B	3T	3	$4,500	144	own...	rol-c..	s-flex..	sol...	48x3½d	48x3½d	Arch..	wd...	own...	4-5½x4½-42.8	2	g-p...	Bush..	sht.....		fin.....	dual..	Bosch..	hand..	none..	none..	none
A. & B	5T	5	.....	144	own...	rol-c..	s-flex..	sol...	48x3½d	48x5d	Arch..	wd...	own...	4-5½x3¾-42.8	2	g-p...	Bush..	sht.....		fin.....	dual..	Bosch..	hand..	none..	none..	none
Acason	R	1	2,100	142	Savg..	p-stl..	flex...	sol*...	36x3½	36x5	Bim..	wd...	Wau..	4-3½x5½-22.5	4	cent...	own...	cst.....	Can..	cel.....	sing..	Eismn.	hand..	none..	none..	none
Acason	RB	1½	2,400	142	Savg..	p-stl..	flex...	sol*...	36x3½	36x6	Bim..	wd...	Wau..	4-3½x5½-22.5	4	cent...	own...	cst.....	Can..	cel.....	sing..	Eismn.	hand..	none..	none..	none
Acason	H	2½	3,150	150	Savg..	p-stl..	flex...	sol...	36x4	36x7*	Bim..	wd...	Wau..	4-4½x5½-29.0	2	cent...	own...	cst.....	Can..	cel.....	sing..	Eismn.	hand..	none..	none..	none
Acason	L	3½	4,150	172	Savg..	p-stl..	flex...	sol...	36x5	36x5d	Bim..	wd...	Wau..	4-4½x6¼-29.0	2	cent...	own...	cst.....	Can..	cel.....	sing..	Eismn.	hand..	none..	none..	none
Acason	M	5	5,150	187	Savg..	p-stl..	flex...	sol...	36x6	40x6d	Sth..	mt....	Wau..	4-4½x6¼-36.2	2	cent...	own...	cst.....	Can..	cel.....	sing..	Eismn.	hand..	none..	.....	...
Ace	A	1½	.....	144	P&B..	p-stl..	flex...	sol...	34x3½	34x5	Sch..	wd...	Buda..	4-3½x5½-22.5	4	ther...	Mod..	cst.....	Mod..	.....	sing..	West..	hand..	sl&i..	West..	none
Ace	A	2½	.....	156	P&B..	p-stl..	flex...	sol*...	36x4	36x7	Day..	mt....	Buda..	4-4½x5½-29.0	4	cent...	Mod..	cst.....	Mod..	.....	sing..	West..	hand..	sl&i-2.	West..	none
Acme	B	1	2,075	130	Smith.	p-stl..	s-flex..	sol...	34x3½	34x5	Bim..	wd...	Con..	4-3½x5-22.50	4	ther...	G&O..	sht.....	G&O..	fin.....	sing..	Eismn.	hand..	lghtg..	G&D..	35
Acme	A	2	2,875	143	Smith.	p-stl..	s-flex..	sol...	36x4	36x7*	Bim..	wd...	Con..	4-4½x5½-27.2	4	cent...	own...	cst.....	G&O..	fin.....	sing..	Eismn.	hand..	lghtg..	G&D..	35
Acme	C	3½	3,875	163	Smith.	p-stl..	s-flex..	sol...	36x5	40x10*	Bim..	wd...	Con..	4-4½x5½-32.4	2	cent...	own...	cst.....	G&O..	fin.....	sing..	Eismn.	hand..	lghtg..	G&D..	35
Acme	E	5	4,975	180	Smith.	p-stl..	s-flex..	sol...	36x6	40x12*	Sth..	mt....	Con..	4-4½x6-36.2	2	cent...	own...	cst.....	G&O..	fin.....	sing..	Eismn.	hand..	lghtg..	G&D..	35
Air-O-Flex	C	1½	.....	160	P&B..	p-stl..	s-flex..	sol...	36x3½	36x5	.....	wd...	Buda..	4-3½x5½-22.5	4	pist...	Mod..	cst.....	Mod..	pln.....	dual..	Wag..	hand..	sl&i-2.	Wag..	none
All-American	A	1	1,595	130	Drt...	p-stl..	flex...	p&s...	33x4	32x4	.....	wd...	H-S..	4-3½x5-16.9	4	ther...	own...	cst.....	Stan..	cel.....	sing..	Smms*	hand..	s&l..	West..	...
All-Power	SV4	3½	4,800	165	Prsh..	p-stl..	s-flex..	sol...	36x6	36x10	Clrk*	mt....	Con..	4-4½x5½-32.4	2	cent...	McC..	cst.....	McC..	fin.....	dual..	Eismn.	hand..	sl&i*..	West..	none
Apex	C	1	1,395	130	own...	rol-c..	rigid..	p&s...	33x4	32x3½	Bim..	wd...	Buda..	4-3½x5½-19.6	4	ther...	Can..	cst.....	Can..	cel.....	sing..	Aut-L..	hand..	s*l&i..	Aut-L*	...
Apex	D	1½	1,595	130	own...	rol-c..	rigid..	sol...	32x3½	32x4	Bim..	wd...	Buda..	4-3½x5½-19.6	4	ther...	Can..	cst.....	Can..	cel.....	sing..	Aut-L..	hand..	s&l..	Aut-L..	75
Apex	E	2½	2,450	150	own...	rol-c..	rigid..	sol...	36x4	36x6	Prud..	wd...	Buda..	4-4½x4½-29.0	4	cent...	Can..	cst.....	Can..	cel.....	sing..	Eismn.	hand..	s&l..	Eismn.	...
Armleder	HW	2½	2,900	150	Smh..	p-stl..	s-flex..	sol...	36x4	36x4d	Crn...	wd...	Con..	4-4½x5½-27.2	4	cent...	Lng..	cst.....	Lng..	fin.....	sing..	Eismn.	hand..	none..	none..	none
Armleder	KW	3½	3,850	186	own...	rol-i..	flex...	sol...	36x5	36x5d	Crn...	wd...	Con..	4-4½x5½-32.4	2	cent...	own...	cst.....	own...	fin.....	sing..	Eismn.	dand..	none..	none..	none
Atco	W20	2	2,875	150	P&B..	p-stl..	rigid..	sol*...	36x4*	36x7*	Sth..	mt....	Buda..	4-4½x5½-29.0	4	cent...	Chgo..	cst.....	Chgo..	fin.....	sing..	Bosch.	hand..	none..	none..	none
Atterbury	7CX	2½	.....	153½	Savg..	p-stl..	flex...	sol...	36x4	36x4d	Arch..	wd...	Con..	4-4½x5½-27.2	4	cent...	own...	cst.....	Lng..	fin.....	sing..	Eismn.	fixed..	lghtg..	Vesta	...
Atterbury	7D	3½	.....	167½	Savg..	p-stl..	flex...	sol...	36x5	40x5d	Arch..	wd...	Con..	4-4½x5½-32.4	2	cent...	own...	cst.....	Lng..	fin.....	sing..	Eismn.	hand..	lghtg..	Vesta	...
Atterbury	8E	5	.....	167½	Savg..	p-stl..	flex...	sol...	36x5	40x6d	Day..	mt....	Con..	4-4½x6-36.2	2	cent...	own...	cst.....	Lng..	fin.....	sing..	Eismn.	hand..	s&l..	Delco.	none
Autocar	21UF	2	2,300	97	own...	rol-c..	s-flex..	sol*...	34x4	34x5	.....	wd...	own..	2-4½x4½-18.1	1	cent...	own...	sht.....	own...	fin.....	sing..	Bosch*	fixed..	9 none..	none..	none
Autocar	UG21	2	2,400	120	own...	rol-c..	s-flex..	sol*...	34x4	34x5	.....	wd...	own..	2-4½x4½-18.1	1	cent...	own...	sht.....	own...	fin.....	sing..	Bosch*	fixed..	none..	none..	none
Autohorse	10	5	2,100	43	own...	rol-c..	rigid..	sol...	34x10	....	Bim..	wd...	Con..	4-3½x5-22.5	4	cent...	Eurk..	sht.....	Eurk..	cel.....	sing..	Eismn.	hand..	none..	none..	none
Available	H2	2	2,950	143	own...	rol-c..	rigid..	sol...	36x4	36x7	Sch..	wd...	Con..	4-4½x5½-27.2	4	cent...	Chgo..	cst.....	Chgo..	fin.....	sing..	Bosch.	hand..	none..	none..	none
Available	H2½	2½	3,250	143	own...	rol-c..	rigid..	sol...	36x4*	36x8	Sch..	wd...	Con..	4-4½x5½-27.2	4	cent...	Chgo..	cst.....	Chgo..	fin.....	sing..	Bosch.	hand..	none..	none..	none
Available	H3	3½	4,200	156	own...	rol-c..	rigid..	sol...	36x5	40x10*	Sch..	wd...	Con..	4-4½x5½-32.4	2	cent...	Chgo..	cst.....	Chgo..	fin.....	sing..	Bosch.	hand..	none..	none..	none
Available	H5	5	4,900	168	own...	rol-c..	rigid..	sol...	36x6	40x6d*	Sch..	wd...	Con..	4-4½x6-36.2	2	cent...	Chgo..	cst.....	Chgo..	fin.....	sing..	Bosch.	hand..	none..	none..	none
Beck	A	1	1,750	132	P&B..	p-stl..	rigid..	sol*...	34x3½*	34x4*	Bim..	wd...	Con..	4-3½x5-19.6	4	ther...	Idl..	cst.....	Idl..	cel.....	sing..	Bosch.	fixed..	lghtg-2	Vesta	75
Beck	B	1½	1,950	144	P&B..	p-stl..	rigid..	sol*...	34x3½*	34x5*	Bim..	wd...	Con..	4-3½x5-22.5	4	ther...	Idl..	cst.....	Idl..	cel.....	sing..	Bosch.	fixed..	lghtg-2	Vesta	75
Beck	C	2	2,350	144	P&B..	p-stl..	rigid..	sol*...	36x4*	36x6*	Bim..	wd...	Con..	4-4½x5½-27.2	4	g-p...	Idl..	cst.....	Idl..	cel.....	sing..	Bosch.	fixed..	lghtg-2	Vesta	75
Belmont	AA	¾	1,150	114	Savg..	p-stl..	s-flex..	pnu...	31x4	31x4	E&O..	wd...	.....	4-3½x5-19.6	4	ther...	Chgo..	cst.....	Chgo..	fin.....	dual..	Conn..	hand..	sl&i 2.	Dneto.	none
Belmont	BB	1½	1,950	144	own...	rol-c..	s-flex..	sol*...	34x4½	36x5	E&O..	wd...	.....	4-3½x5½-22.5	4	cent...	Chgo..	cst.....	Chgo..	fin.....	sing..	Eismn.	hand..	lghtg..	Dneto.	none
Bessemer	G	1	1,600	124	Savg..	p-stl..	s-flex..	sol*...	34x3	34x4	Sch..	wd...	Con..	4-3½x5-19.6	4	ther...	Idl..	sht.....	Idl..	cel.....	sing..	Bosch.	hand..	opt..	opt..	...
Bessemer	H-2	1½	2,085	144	P&B..	p-stl..	s-flex..	sol*...	36x3½	36x5	Sch..	wd...	Con..	4-3½x5-22.5	4	ther...	own...	cst.....	Idl*..	cel.....	sing..	Bosch.	hand..	opt..	opt..	...
Bessemer	J-2	2½	2,785	153	P&B..	p-stl..	s-flex..	sol*...	36x4	36x4	Sch..	wd*...	Con..	4-4½x5½-27.2	4	cent...	own...	cst.....	Idl*..	cel.....	sing..	Bosch.	hand..	opt..	opt..	...
Bessemer	K-2	4	3,985	175	P&B..	p-stl..	s-flex..	sol...	36x6	36x10	Sth..	mt....	Con..	4-4½x5½-32.4	4	ther...	own...	cst.....	Stan..	cel.....	sing..	Bosch.	hand..	opt..	opt..	...
Bethlehem	DG	1½	2,095	136	Drt...	p-stl..	s-flex..	sol...	34x3½	34x5	Way..	wd...	own..	4-4x5½-25.6	4	ther...	Fed...	cst.....	Fed...	cel.....	sing..	A-Knt	hand..	s&l-2..	G&D..	none
Bethlehem	EH	2½	2,495	144	Drt...	p-stl..	s-flex..	sol...	34x4	34x6	Way..	wd...	own..	4-4x5½-25.6	4	ther...	Fed...	cst.....	Fed...	cel.....	sing..	A-Knt	hand..	s&l-2..	G&D..	none
Bethlehem	FJ	3½	3,595	162	Drt...	p-stl..	s-flex..	sol...	34x4	34x5d	Way..	wd...	own..	4-4½x5½-32.4	4	ther...	Fed...	cst.....	Fed...	cel.....	sing..	A-Knt	hand..	s&l-2..	G&D..	none
Betz		2½	2,700	150	P&B..	p-stl..	s-flex..	sol...	36x4	36x7	Day..	mt....	Buda..	4-4½x5½-29.	4	cent...	Chgo..	cst.....	Chgo..	fin.....	sing..	Bosch.	fixed..	none..	none..	none
Bollstrom	A	5	.....	144	own...	rol-c..	flex...	sol*...	36x6	36x6	clrk..	mt....	own..	4-4½x5½-29.0	1	cent...	own...	cst.....	own...	.....	sing..	Bosch.	hand..	.....	.....	...
Brinton	F	2½	3,000	150	own...	rol-c..	s-flex..	sol...	36x4	36x6	Sch..	wd...	Con..	4-4½x5½-27.2	4	cent...	M-R..	cst.....	M-R..	fin.....	sing..	Bosch.	hand..	none..	none..	none
Briscoe	T-34	1	1,485	121	Prsh..	p-stl..	rigid..	p&s...	33x4	34x4	Hay..	wd...	own..	4-3½x5-18.2	4	ther...	Pfx...	cst.....	Pfx...	zz-t....	sing..	Conn..	hand..	sl&i-2.	Aut-L.	none
Brockway	S	1½	2,100	140	Prsh..	p-stl..	s-flex..	sol...	36x3½	36x5	H&D..	wd...	Con..	4-3½x5-22.5	4	ther...	Bush..	cst.....	Bush..	fin.....	sing..	Eismn.	fixed..	sl&i-2.	Dneto.	200
Brockway	K-4	2½	2,950	152	Prsh..	p-stl..	s-flex..	sol...	36x4	36x7	H&D..	wd...	Con..	4-4½x5½-27.2	4	cent...	Bush..	cst.....	Bush..	fin.....	sing..	Eismn.	hand..	sl&i-2.	Dneto.	200
Brockway	R-2	3½	3,900	164	Prsh..	p-stl..	s-flex..	sol...	36x5	36x5d	Sth..	mt....	Con..	4-4½x5½-32.4	2	cent...	Bush..	cst.....	Bush..	fin.....	sing..	Eismn.	hand..	sl&i-2.	Dneto.	200
Brockway	T-5	5	5,000	172	Prsh..	p-stl..	s-flex..	sol...	36x6	40x6d	Sth..	mt....	Con..	4-4½x6-36.2	2	cent...	Lng..	cst.....	Lng..	fin.....	sing..	Eismn.	hand..	none..	none..	...
Champion	1200	3/5	1,000	114	.....	p-stl..	s-flex..	pnu...	32x4	32x4	.....	wd...	Lght..	4-3½x4½-16.9	4	ther...	.....	.....	prs.....	.....	zz-t....	sing..	A-Knt	hand..	lghg-2.	.....	none
Clydesdale	32X	1	.....	144	P&B..	p-stl..	s-flex..	sol*...	34x3½*	34x5*	.....	wd...	Con..	4-3½x5-22.5	4	ther...	own...	cst.....	own...	pln.....	sing..	Bosch.	hand..	.....	.....	...

ABBREVIATIONS—Types of Construction

*****—other options
amid—amidship
auto—automatic
bevl—bevel
cel—cellular
cent—centrifugal
chn—chain
cst—cast
ctr—center
cylinders cast, 2 in pairs
cylinders cast, 4 in block
cylinders cast, 3 in threes
cylinders cast, 1 singly
cyl-ends—cylinder-ends
d—dual
d-d—dry-disk
d-p—dry-plate
dplx—from both motor & driveshaft
d-rd—double reduction
d-s—drive-shaft
elec—electric
ext-d-s—external drive-shaft
ext-f-w—external front wheel
ext-g—external gear
ext-jst—external jack-shaft
ext-r-w—external rear wheel
fab—fabric
fin—finned tube
flex—flexible
fric—friction
g-p—gear pump
grv—gravity
gset—from gearset
hyd—hydraulic
ind-c—individual clutch
int-g—internal gear
int-g-4—internal gear drive on 4 wheels
int-r-w—internal rear wheel
jst—unit with jackshaft
l—left
l-b—loose ball
lghtg—lighting only
motr—unit with motor
mt—metal (wheels)
mtl—metal (universal joint)
opt—optional
pist—piston pump
plan—planetary
pln—plain tube
pnu—pneumatic
pres—pressure
prog—progressive
prs—pressed steel
p&s—pneumatics in front, solids in rear
p-stl—pressed steel
r—right
r&c—right & center
r-rd—radius rods
rol-c—rolled channel
rol-i—rolled I-beam
selec—selective
s-flex—semi-flexible
sht—sheet
s&l—starting & lighting
sl&i-2—starting, lighting & ignition, 2 unit
sol—solid
sprgs—springs
sq-t—square-tube
start—starting only
t-arm—torque arm
ther—thermo-syphon
t-p—two-point
t-t—torsion tube
vac—vacuum
wat-tube—water tube
wd—wood
w-d—multiple disk in oil
w-p—plate in oil
wr—wire
zz-t—zig-zag tube

ABBREVIATIONS—Makers of Parts

*Other Options
Acme—Acme Universal Joint Mfg. Co.
A-Knt—Atwater-Kent
Al-Ch—Allis-Chalmers
Aloy—Alloy Steel Spring
Amer—American Magneto Co.
Arch—Archibald
Arvac—Arvac Co.
Aut-L—Auto-Lite
Auto—Auto-Wheel Co.
A-W-W—Automotive Wire Wheel Co.
B&B—Ball & Ball
B-Beck—Borg & Beck
Berlg—Berling
Bet—Betts Spring Co.
Bim—Bimel
B-Lipe—Brown-Lipe
Blood—Blood Bros.
Brem—Bremer
Bvr—Beaver Mfg. Co.
B&W—B & W Mfg. Co.
Can—Candler Radiator
Cant—Canton-Cleveland
Carl—Carleton Co.
Cart—Carter Carburetor
Cas—G. M. Castle
CAS—C. A. S. Products
Chgo—Chicago Mfg. Co.
Chic—Chicago-Standard
Chmp—Champion Auto Spring Co.
Chy—Cheney
Clrk—Clark Equipment
Col—Columbia Axle Co.
Con—Continental Motor
Conn—Connecticut
Crn—Crane & Mac-Mahon Co.
C-S—Christopher Simpson Iron Co.
Day—Dayton
Del—Delaney
Detlaf—Detlaff

of Gasoline Motor Trucks for 1920

208 American Manufacturers—Full Particulars of Types and Gearsets, Rear Axles, Steering Gears, Governors and Also Fuel Systems

ENGINE										TRANSMISSION										BRAKES		CONTROL			UNIVERSALS		
GOVERNOR			SPEED		FUEL SYS.		CLUTCH			GEARSET				FINAL DRIVE								STEERING GEAR					
Type	Make	Drive	Motor in r.p.m.	Truck in m.p.h.	Carbureter Make	Fuel Feed	Type	Make	Extra Cost $	Type	Make	Placed	Speeds	Type	Rear Axle Make	Total Gear Reduction	Propulsion Taken By	Torque Taken By	Springs Make	Foot	Hand	Placed	Make	Levers	Type	Make	Name and Model
none.	none...	.....	.....	.....	Schblr..	grv...	none...	none...		elec...	none...	amid..	2	int-g-f.	own	.....	r-rd...	r-rd...	S-P...	ext-r-w..	ext-f-w	r...	Gem..	r...	mtl..	Franck	A. & B.....3T
none.	none...	.....	.....	.....	Schblr..	grv...	none...	none...		elec...	none...	amid..	2	int-g-f.	own	.....	r-rd...	r-rd...	S-P...	ext-r-w..	ext-f-w	r...	Gem..	r...	mtl..	Franck	A. & B.....5T
cent.	Wau...	motor	.....	.....	Schblr..	grv...	d-d...	Fuller..	selec...	Fuller..	motr..	3	worm.	Timkn.	8.25	sprgs..	sprgs..	.....		int-r-w..	int-r-w	.....	Ross..	ctr..	mtl..	Blood..	Acason.....R
cent.	Wau...	motor	.....	.....	Schblr..	vac...	d-d...	B-Beck.	ind-c...	Cotta..	motr..	3	worm.	Timkn.	9.25	sprgs..	sprgs..	.....		int-r-w..	int-r-w	.....	Ross..	ctr..	mtl..	Blood..	Acason.....RB
cent.	Wau...	motor	.....	.....	Schblr..	vac...	d-d...	B-Beck.	ind-c...	Cotta..	motr..	3	worm.	Timkn.	8.50	sprgs..	sprgs..	.....		int-r-w..	int-r-w	r...	Ross..	ctr..	mtl..	Blood..	Acason.....H
cent.	Wau...	motor	.....	.....	Schblr..	vac...	d-d...	B-Beck.	ind-c...	Cotta..	motr..	3	worm.	Timkn.	10.33	sprgs..	sprgs..	.....		int-r-w..	int-r-w	.....	Ross..	ctr..	mtl..	Blood..	Acason.....L
cent.	Wau...	motor	.....	.....	Schblr..	vac...	d-p...	B-Beck.	ind-c...	Cotta..	motr..	3	worm.	Timkn.	10.25	sprgs..	sprgs..	.....		int-r-w..	int-r-w	.....	Ross..	ctr..	mtl..	Blood..	Acason.....M
cent.	Pierce..	motor	1200	17	Schblr..	grv...	d-d...	M & E.	selec...	Cotta..	amid..	3	worm.	Timkn.	7.00	sprgs..	sprgs..	Mth..		int-r-w..	int-r-w	l...	Ross..	ctr..	mtl..	Spicer..	Ace.....A
cent.	Pierce..	motor	1000	14	Schblr..	grv...	d-d...	B-Lipe.	selec...	B-Lipe.	amid..	4	worm.	Timkn.	7.75	sprgs..	sprgs..	Mth..		int-r-w..	int-r-w	l...	Ross..	ctr..	mtl..	Spicer..	Ace.....A
cent.	Dplx...	gearst	1700	22	Rayfld.	vac...	d-p...	B-Beck.	ind-c...	Cotta..	motr..	3	worm.	Timkn.	7.75	sprgs..	sprgs..	Dtr...		int-r-w..	int-r-w	l...	Ross..	ctr..	mtl..	Blood..	Acme.....B
cent.	Dplx...	gearst	1500	17	Rayfld.	vac...	d-p...	B-Beck.	ind-c...	Cotta..	motr.	4	worm.	Timkn.	8.50	sprgs..	sprgs..	Dtr...		int-r-w..	int-r-w	l...	Ross..	ctr..	mtl..	Blood..	Acme.....A
cent.	Dplx...	gearst	1200	13	Rayfld.	vac...	d-p...	B-Beck.	ind-c...	Cotta..	amid..	4	worm.	Timkn.	12.00	r-rd...	sprgs..	Dtr...		int-r-w..	int-r-w	l...	Ross..	ctr..	mtl..	Blood..	Acme.....C
l-b..	Con...	motor	1250	13	Rayfld.	vac...	d-p...	B-Beck.	ind-c...	Cotta..	amid..	4	worm.	Timkn.	11.67	r-rd...	sprgs..	Dtr...		int-r-w..	int-r-w	l...	Ross..	ctr..	mtl..	Blood..	Acme.....E
suct..	Phro...	motor	1800	28	Stmbg.	grv...	d-p...	B-Beck.	selec...	B-Lipe.	amid..	4	int-g..	Russl..	5.46	r-rd...	r-rd...	.....		int-r-w..	ext-r-w	l...	Ross..	ctr..	fab..	Therm.	Air-O-Flex.....C
.....	.....	.....	2500	25	Stmbg.	grv...	d-p...	B-Beck.	selec...	G-Lees.	motr..	3	int-g..	Torbn..	6.50	sprgs..	sprgs..	Dtr...		ext-r-w..	int-r-w	l...	Ross..	ctr..	mtl..	Univl..	All-American.....A
suct..	Phro...	motor	1500	23	Zenith.	grv...	d-d...	Detlaf..	ind-c...	Cotta..	motr..	3	worm.	Timkn.	.....	sprgs..	sprgs..	Tuth..		ext-r-w..	int-r-w	l...	Ross..	ctr..	mtl..	Unvsl..	All-Power.....SV4
none.	none...	.....	.....	35	Stmbg.	vac...	d-d...	Fuller..	selec...	Fuller..	motr..	3	int-g..	Torbn..	6.50	sprgs..	sprgs..	Dtr...		ext-r-w..	int-r-w	l...	Lavn..	ctr..	mtl..	Univl..	Apex.....C
none.	none...	.....	.....	.....	Stmbg.	vac...	d-d...	Fuller..	selec...	Fuller..	motr..	3	int-g..	Torbn..	8.00	sprgs..	sprgs..	Dtr...		ext-r-w..	int-r-w	l...	Lavn..	ctr..	mtl..	Univl..	Apex.....D
cent.	Dplx...	motor	1177	14	Stmbg.	vac...	d-d...	Fuller..	selec...	Fuller..	motr..	3	int-g..	Torbn..	9.00	sprgs..	sprgs..	Dtr...		ext-r-w..	int-r-w	l...	Lavn..	ctr..	mtl..	Univl..	Apex.....E
cent.	Pierce..	motor	1100	16	Schblr.	grv...	d-d...	B-Lipe.	selec...	B-Lipe.	motr..	3	worm.	Timkn.	8.75	r-rd...	sprgs..	Mth..		int-r-w..	int-r-w	l...	Ross..	ctr..	mtl..	Spicer*	Armleder.....HW
cent.	Pierce..	motor	1100	14	Schblr.	grv...	d-d...	B-Lipe.	selec...	B-Lipe.	motr..	3	worm.	Timkn.	8.75	r-rd...	sprgs..	Mth..		int-d-s..	int-r-w	l...	Ross..	ctr..	mtl..	Spicer*	Armeder.....KW
cent.	Pierce..	motor	1150	16	Stmbg.	vac...	d-d...	Fuller..	selec...	Fuller..	amid..	4	worm.	Wis ...	7.75	sprgs..	sprgs..	Shel...		int-r-w..	int-r-w	l...	Ross.	ctr..	mtl..	Hart...	Atco.....W20
suct..	Mnsch.	motor	1300	15	Zenith.	grv...	d-d...	B-Lipe.	selec...	B-Lipe.	motr..	4	worm.	Timkn.	9.25	sprgs.	sprgs..	Sp-P..		int-r-w..	int-r-w	r...	Gem..	r...	mtl..	Spicer..	Atterbury.....7CX
suct..	Mnsch.	motor	1200	13	Zenith.	grv...	d-d...	B-Lipe.	selec...	B-Lipe.	motr..	4	worm.	Timkn.	10.33	sprgs..	.....	Sp-P..		int-r-w..	int-r-w	r...	Gem..	r...	mtl..	Spicer..	Atterbury.....7D
cent.	Con...	motor	1150	11	Zenith.	vac...	d-d...	B-Lipe.	selec...	B-Lipe.	amid.	4	worm.	Timkn.	11.60	r-rd...	.....	Sp-P..		int.....	int.....	l...	Gem..	ctr..	mtl..	Spicer..	Atterbury.....8E
none.	none...	none..	.....	20	Stmbg.	grv...	d-p...	own...	prog...	own...	amid..	3	d-rd...	own...	8.30	sprgs..	sprgs..	.....		ext-r-w..	int-r-w	r...	own...	r...	mtl..	.....	Autocar.....21UF
none.	none...	none..	.....	20	Stmbg.	grv...	d-p...	own...	prog...	own...	amid..	3	d-rd...	own...	8.30	sprgs..	sprgs..	.....		ext-r-w..	int-r-w	r...	own...	r...	mtl..	.....	Autocar.....UG21
none.	none...	none..	1200	15	Stmbg.	grv...	d-p...	B-Beck.	selec...	Detrt..	amid..	3	int-g..	own...	11.41	tor-a..	tor-a..	Chmp		ext-d-s..	int-f-w	c...	own...	r...	.....	.....	Autohorse.....10
none.	none...	none..	940	13	Stmbg	grv...	d-d...	B-Lipe.	selec...	B-Lipe.	amid.	4	worm.	Wis*...	7.75	r-rd...	sprgs..	Tuth..		int-r-w..	int-r-w	l...	Ross*.	ctr..	mtl*.	Spicer*	Available.....H2
cent.	Pierce..	motor	1051	13	Stmbg.	grv...	d-d...	B-Lipe.	selec...	B-Lipe.	amid..	4	worm.	Wis*..	8.66	r-rd...	sprgs..	Tuth..		int-r-w..	int-r-w	l...	Ross*.	ctr..	mtl*.	Spicer*	Available.....H2½
cent.	Pierce..	motor	924	9	Stmbg.	grv...	d-d...	B-Lipe.	selec...	B-Lipe.	amid..	4	worm.	Wis*..	10.66	r-rd...	sprgs..	Tuth..		int-r-w..	int-r-w	l...	Ross*.	ctr..	mtl*.	Spicer*	Available.....H3
cent.	Con...	motor	881	9	Stmbg.	grv...	d-d...	B-Lipe.	selec...	B-Lipe.	amid..	4	worm.	Timkn.	11.66	r-rd...	sprgs..	Tuth..		int-r-w..	int-r-w	l...	Ross..	ctr..	mtl*.	Spicer*	Available.....H5
cent.	Pierce..	motor	.....	.....	Stmbg.	grv...	d-d...	Fuller..	selec...	.....	motr..	3	int-g..	Clrk...	6.50	sprgs..	sprgs..	Hig...		ext-r-w..	int-r-w	l...	Lavn..	ctr..	fab..	Blood..	Beck.....A
cent.	Pierce.	motor	.....	.....	Stmbg.	grv...	d-d...	Fuller..	selec...	.....	motr..	3	int-g..	Clrk...	8.00	sprgs..	sprgs..	Hig...		ext-r-w..	int-r-w	l...	Lavn..	ctr..	mtl..	Blood..	Beck.....B
cent.	Pierce.	d-s...	.....	.....	Stmbg.	grv...	d-d...	Fuller..	selec...	.....	motr..	3	int-g..	Clrk...	9.00	sprgs..	sprgs..	Hig...		ext-r-w..	int-r-w	l...	Lavn..	ctr..	mtl..	Blood..	Beck.....C
cent.	Pierce..	motor	1050	18	Zenith.	grv...	W-P..	G-Lees.	selec...	G-Lees.	motr..	3	int-g..	Clrk...	5.25	sprgs..	sprgs..	Mth..		ext-r-w..	int-r-w	l...	Lavn..	ctr.	mtl..	Sterl..	Belmont.....AA
cent.	Pierce..	motor	1050	16	Zenith.	vac...	W-P..	G-Lees.	selec...	G-Lees.	motr..	3	int-g..	Clrk...	7.00	sprgs..	sprgs..	Mth..		ext-r-w..	int-r-w	l...	Lavn..	ctr..	mtl..	Sterl..	Belmont.....BB
none	none...	none.	1450	20	Zenith.	grv...	d-d...	Fuller..	selec...	Fuller..	motr..	3	int-g..	Torbn..	7.00	sprgs..	sprgs..	S-P...		ext-r-w..	int-r-w	l...	Ross..	ctr..	mtl..	Arvac..	Bessemer.....G
cent.	Pierce..	motor	1400	17	Zenith.	grv...	d-p...	B-Beck.	selec...	B-Lipe.	amid..	3	int-g..	Torbn..	8.00	r-rd...	sprgs..	S-P...		ext-r-w..	int-r-w	l...	Ross..	ctr..	mtl..	Arvac..	Bessemer.....H-2
cent.	Pierce..	motor	1400	14	Zenith.	grv...	d-p...	B-Beck.	selec...	B-Lipe.	amid.	4	int-g..	Torbn..	8.00	r-rd...	sprgs..	S-P...		ext-r-w..	int-r-w	l...	Ross..	ctr..	mtl..	Arvac..	Bessemer.....J-2
cent.	Pierce..	motor	1250	12	Zenith.	grv...	d-p...	B-Beck.	selec...	B-Lipe.	amid.	4	int-g..	Torbn..	10.25	r-rd...	sprgs..	S-P...		int-r-w..	ext-d-s	l...	Ross.	ctr..	mtl..	Spicer	Bessemer.....K-2
cent.	Pierce.	motor	1358	18	Stmbg.	grv...	d-p...	B-Beck.	selec...	Detrt..	motr..	3	int-g..	Russel.	8.20	sprgs.	sprgs..	Shel...		ext-r-w..	int-r-w	l...	Lavn..	ctr..	mtl..	Univl..	Bethlehem.....DG
cent.	Pierce.	motor	1303	15	Stmbg.	grv...	d-p...	B-Beck.	selec...	Detrt..	motr..	3	int-g..	Russel.	10.02	sprgs..	sprgs..	Shel...		ext-r-w..	int-r-w	l...	Lavn..	ctr..	mtl..	Univl..	Bethlehem.....EH
cent.	Pierce.	motor	1113	12	Stmbg.	grv...	d-p...	B-Beck.	selec...	Detrt..	motr..	3	int-g..	Russel.	9.40	sprgs..	sprgs..	Shel...		ext-r-w..	int-r-w	l...	Lavn..	ctr..	mtl..	Spicer..	Bethlehem.....FJ
cent.	Pierce..	motor	1100	15	Stmbg.	grv...	d-d/...	B-Lipe.	selec...	B-Lipe.	motr..	4	worm.	Timkn.	8.50	sprgs..	sprgs..	Tuth..		int-r-w..	int-r-w	l...	Ross.	ctr..	mtl..	Univl..	Betz.....
cent.	.....	motor	1000	12	Stmbg.	grv...	d-d...	.....	ind-c...	own...	amid..	4	int-g..	own...	.....	sprgs..	sprgs..	.....		ext-d-s..	ext-w4	l...	Gem..	ctr..	mtl..	own...	Bollstrom.....A
cent.	Pierce..	motor	1000	18	Stmbg.	grv...	d-d...	B-Lipe.	selec...	B-Lipe.	motr..	3	worm.	Timkn.	.....	r-rd...	t-arm.	Phila..		int-r-w..	int-r-w	l...	Ross.	l&c.	mtl..	Spicer..	Brinton.....F
none.	none...	none..	2400	25	Buick..	grv...	cone..	own...	selec...	own...	motr..	3	int-g..	Russel.	8.20	sprgs..	sprgs..	Aloy..		ext-r-w..	int-r-w	l...	Lavn..	ctr.	mtl.	Unvsl..	Briscoe.....T-34
none.	none...	.....	1300	18	Schblr.	vac...	d-d...	B-Lipe.	selec...	B-Lipe.	motr..	3	worm.	Shel....	7.80	r-rd...	sprgs..	Merl..		int-r-w..	int-r-w	l...	Gem..	ctr..	mtl.	Spicer..	Brockway.....S
none.	none...	.....	1200	15	Schblr.	grv...	d-d...	B-Lipe.	selec...	B-Lipe.	amid..	4	worm.	Timkn.	8.50	r-rd...	sprgs..	Merl..		int-r-w..	int-r-w	l...	Gem..	ctr..	mtl.	Spicer..	Brockway.....K-4
none.	none...	.....	1200	12	Schblr.	grv...	d-d...	B-Lipe.	selec...	B-Lipe.	amid.	4	worm.	Timkn.	10.33	r-rd...	sprgs..	Merl..		int-r-w..	int-r-w	l...	Gem..	ctr..	mtl.	Spicer..	Brockway.....R-2
l-b..	Con...	motor	1200	12	Schblr.	vac...	d-d...	B-Lipe.	selec...	B-Lipe.	amid..	4	worm.	Timkn.	11.66	r-rd...	sprgs..	Merl..		int-r-w..	int-r-w	l...	Gem..	ctr..	mtl.	Spicer..	Brockway.....T-5
none.	none...	.....	.....	.....	.....	grv...	d-p...	.....	selec...	.....	motr..	3	bevel.	.....	5.25	sprgs..	sprgs..	.....		ext-r-w..	int-r-w	l...	.....	ctr..	mtl.	.....	Champion.....1200
cent.	own...	motor	1200	17	Zenith.	grv...	d-d...	B-Lipe.	selec...	B-Lipe.	motr..	3	worm.	S.P....	7.25	r-rd...	sprgs..	S-P...		int-r-w..	int-r-w	l...	Ross.	ctr..	mtl.	Spicer..	Clydesdale.....32X

ABBREVIATIONS—Makers of Parts—(Continued)—

Detrt—Detroit G. & M.
Ditw—Ditwiler Mfg. Co.
Dneto—Dyneto
Drt—Detroit Pressed Steel Co.
Dtr—Detroit Products
Dtrt—Detroit Lubricator
Dun—Dunbar Mfg. Co.
Dur—Durston Gear Corp.
E&M—English & Mersick
E&O—Eberly & Orris
Eismn—Eisemann
Ens—Ensign Carburetor
Eric—Ericsson Mfg. Co.
Eurk—Eureka
F&H—French & Hecht
FAC—F. A. Chapper
Fed—Fedders
Flx—Flexo Mfg. Co.
Frank—Francke Co.
G&D—Gray & Davis
G&O—G & O Mfg. Co.
GCS—Garden City Springs
Gem—Gemmer
G-Lees—Grant-Lees
Grn—Greens Car Wheel
H&D—Hoopes Bros. & Darlington
Har—Harrison
Hart—Hartford
Harv—Harvey
Hay—Hayes Wheel Co.
Her—Hercules
Hig—Higgins
Hink—Hinkley
Hol—Holley
H-Shaw—Hele-Shaw
H-S—Herschell-Spillman
Hyd—Hydraulic
Idl—Ideal
Ind—Indestructible
Iron—Iron City
Jacox—Jackson-Church-Wilcox
Jck—Jackson Auto
Jns—Phineas Jones & Co.
John—Johnson Co.
Kal—Kalamazoo
Kel—Kelsey Wheel Co.
Ken—Kenosha Wheel & Darlington
Knz—Kuntz
Lavn—Lavine
LeR—Le Roi
Lght—Light Mfg. Co.
L-N—Leece-Neville Co.
Lng—Long
Lvgn—Livingston
Lyc—Lycoming
Marvl—Marvel
Mas—F. C. Mason & Co.
Mast—Master
McCn—McCanna
M&E—Merchant & Evans
McC—McCord
Mech—Mechanics Mach. Co.
Merl—Merrill Spring Co.
Miller—H. A. Miller
Mnrch—Monarch
Mod—Modine Mfg. Co.
Mot—Mott Wheel Wks.
M-R—Marlin-Rockwell
MSC—Massillon
Mth—Mather
Mut—Mutual Wheel Co.
Nat—National Spring
Natl—National Can Co.
N-E—North East
Nich—Nichols Elec. Co.
P&B—Parish & Bingham
Perk—Perkins
Pet—Peters Mach. Co.
Pfx—Perfex Radiator
Phil—Philadelphia
Phro—Pharo Mfg. Co.
Prsh—Parish Mfg. Co.
Prud—Prudden
Rayfld—Rayfield
Rem—Remy
Rowl—Wm. H. Rowland
Roy—Royer Wheel Co.
R-T—Rome-Turney
Rugl—Ruggles
Rus—Russel Car & Frdy.
Russl—Russel Axle Co.
Rut—Rutenber
R&V—Root & VanDervoort
Sag—Saginaw
Sal—Salisbury
Savg—Savage Arms
Sch—Schwarz Wheel Co.
Schblr—Schebler
Shel—Sheldon
Simp—Simplex
S-J—Shotwell-Johnson
S-M—Standard Malleable
Smh—A. O. Smith
Sth—Smith Steel Wheel
S-P—Standard Parts Co.
Spltf—Splitdorf
Sp-P—Spring Perch Co.
Stan—Standard Radiator
Stand—Standard Steel Spring Co.
Sterl—Sterling Bearings
Stmbg—Stromberg
Stn—Standard Wheel Co.
S-W—Sparks-Withington
Sum—Sumter Elec. Co.
Therm—Thermoid
Timkn—Timken
Torbn—Torbensen
Tuth—Tuthill
Univl—Universal Prdts.
Unv—Universal
Unvsl—Universal Mach.
U. S.—U. S. Spring Co.
Wag—Wagner
Warn—Warner
Wau—Waukesha
West—Westinghouse
Wil-B—Wilcox Bennett
Wis—Wisconsin Parts
W-L—Ward-Leonard
W&L—Waterhouse & Lester Co.
Way—Wayne Wheel Co.
Wol—Wohlrab
Wsc—Wisconsin
Yng—Youngstown Pressed Steel Co.

Detailed Technical Specifications of

Name and Model	Tons Capacity	Chassis Price	Wheelbase, Inches	FRAME: Make	FRAME: Material	FRAME: Type	TIRES: Kind	TIRES: Size in Ins. Front	TIRES: Size in Ins. Rear	WHEELS: Make	WHEELS: Type	ENGINE: Make	ENGINE: No. Cyl. Bore and Stroke—N.A.C.C. Hp.	ENGINE: Cy'inders Cast	COOLING: Water Circ.	COOLING: Radiator CASE Make	COOLING: Radiator CASE Type	COOLING: Radiator CORE Make	COOLING: Radiator CORE Type	IGNITION: Type	IGNITION: Make	IGNITION: Spark Advance	ELEC. SYSTEM: Type	ELEC. SYSTEM: Make	ELEC. SYSTEM: Extra Cost $
Clydesdale 42	1½	$2,445	146	P&B..	p-stl..	s-flex..	sol*...	36x3½*	36x6*	.....	wd....	Con...	4-3½x5-22.5	4	ther...	own...	cst.....	own...	pln....	sing..	Bosch.	hand..	.....	.....	....
Clydesdale 65X	2½	3,200	163	P&B..	p-stl..	s-flex..	sol*...	36x4*	36x8*	Sth...	mt....	Con...	4-4½x5½-27.2	4	cent...	own...	cst.....	own...	pln....	sing..	Bosch.	hand..	.....	.....	....
Clydesdale 99	3½	4,075	180	P&B..	p-stl..	s-flex..	sol....	36x5	40x10	Sth...	mt....	Con...	4-4½x5½-32.4	2	cent...	own...	cst.....	own...	pln....	sing..	Bosch.	hand..	.....	.....	....
Clydesdale 120B	5	5,025	176	P&B..	p-stl..	s-flex..	sol....	36x6	40x12	Sth...	mt....	Con...	4-4½x6-36.11	2	cent...	own...	cst.....	own...	pln....	sing..	Bosch.	hand..	.....	.....	....
Collier 18	1	.....	140	.....	p-stl..	.....	sol....	34x4	34x5*	.....	.....	Con...	4-3½x5-19.6	4	cent...	Lng..	.....	.....	.....	.....	Eismn.	.....	.....	.....	....
Collier 19	1½	.....	144	.....	rol-c..	.....	sol....	36x4	36x6*	.....	.....	Con...	4-3½x5-22.5	4	cent...	.....	.....	.....	.....	.....	Eismn.	.....	.....	.....	....
Collier 20	2	.....	152	.....	rol-c..	.....	sol....	36x4	36x7	.....	.....	Con...	4-4½x5½-27.2	4	cent...	.....	.....	.....	.....	.....	Eismn.	.....	.....	.....	....
Columbia F	1	1,750	123	own...	rol-c..	flex..	sol....	34x3½	34x4	Crn...	wd....	Con...	4-3½x5-22.5	4	cent...	Lng..	cst.....	Lng..	fin....	sing..	Bosch.	hand..	none..	none..	none
Columbia G	2½	2,750	144	own...	rol-c..	s-flex..	sol....	36x4	36x7	Crn...	wd....	Hink..	4-4x5½-25.6	4	cent...	Lng..	cst.....	Lng..	fin....	sing..	Bosch.	hand..	s&l-2.	Remy.	125
Commerce E	1	1,590	126	Drt...	p-stl..	flex..	sol*...	34x3*	34x4*	Bim...	wd....	Con...	4-3½x5-22.5	4	ther...	Lng..	cst.....	Lng..	fin....	sing..	Eismn.	fixed.	s&l..	Bijur.	none
Commerce EP	1½	1,965	134	Drt...	p-stl..	flex..	pnu...	36x6	36x6	Bim...	wd....	Con...	4-3½x5-22.5	4	ther...	Lng..	cst.....	Lng..	fin....	sing..	Eismn.	fixed.	s&l..	Bijur.	none
Concord A	1½	2,350	140	P&B..	p-stl..	s-flex..	sol....	36x3½	36x5	Crn...	wd....	Buda..	4-3½x5½-22.5	4	cent...	Bush..	cst.....	Bush.	fin....	sing..	Eismn.	hand..	.....	.....	....
Concord B	2½	2,850	150	P&B..	p-stl..	s-flex..	sol....	36x4	36x4d	Crn...	wd....	Buda..	4-4½x5½-29.0	4	cent...	Bush..	cst.....	Bush.	fin....	sing..	Eismn.	hand..	.....	.....	....
Conestoga 12	¾	.....	124	Savg..	p-stl..	.....	pnu...	32x4½	32x4½	E&O..	wd....	Con...	4-3½x5-19.6	4	ther...	.....	.....	.....	.....	cel....	sing..	Simms	hand..	s&l..	.....	none
Conestoga 20	1	2,100	128	own...	rol-c..	.....	sol*...	34x3½*	34x5*	E&O..	wd....	Con...	4-3½x5-19.6	4	ther...	own...	cst.....	E&M.	fin....	sing..	Simms	hand..	.....	.....	....
Conestoga 30	2	2,700	138	own...	rol-c..	rigid..	sol....	36x4	36x4d	E&O..	wd....	Con...	4-3½x5-22.5	4	ther...	own...	cst.....	E&M.	fin....	sing..	Simms	hand..	.....	.....	....
Corbitt E	1	2,200	130	own...	rol-c..	flex..	sol....	34x3½	34x4	Bim...	wd....	Con...	4-3½x5-22.5	4	ther...	McC..	cst.....	McC..	fin....	sing..	Eismn.	hand..	none..	none..	....
Corbitt D	1½	2,600	130	own...	rol-c..	flex..	sol....	36x3½	36x5	Bim...	wd....	Con...	4-3½x5-22.5	4	ther...	McC..	cst.....	McC..	fin....	sing..	Eismn.	hand..	none..	none..	....
Corbitt C	2	3,250	143	own...	rol-c..	.....	sol....	36x3½	36x7	Bim...	wd....	Con...	4-4½x5½-27.2	4	cent...	McC..	cst.....	McC..	fin....	sing..	Eismn.	hand..	none..	none..	....
Corbitt B	2½	3,500	143	own...	rol-c..	s-flex..	sol....	36x4	36x7	Bim...	wd....	Con...	4-4½x5½-27.2	4	cent...	McC..	cst.....	McC..	fin....	sing'	Eismn.	hand..	none..	none..	....
Corbitt A	3½	4,200	173	own...	rol-c..	s-flex..	sol....	36x5	36x10	Sth...	mt....	Con...	4-4½x5½-32.4	2	cent...	McC..	cst.....	McC..	fin....	sing..	Eismn.	hand..	none..	none..	....
Corbitt AA	5	5,000	178	own...	rol-c..	s-flex..	sol....	36x6	40x12	Sth...	mt....	Con...	4-4½x6-36.2	2	cent...	McC..	cst.....	McC..	fin....	sing..	Eismn.	hand..	none..	none..	....
Day-Elder A	1	1,925	128	Savg..	p-stl..	s-flex..	sol....	34x3	34x4	Jns...	wd....	Con...	4-3½x5-22.5	4	ther...	Bush..	cst.....	Bush..	fin....	sing..	Eismn.	fixed.	s&l..	Eismn.	150
Day-Elder B	1½	2,200	144	Savg..	p-stl..	s-flex..	sol....	34x3½	34x5	Jns...	wd....	Con...	4-3½x5-22.5	4	ther...	Bush..	cst.....	Bush..	fin....	sing..	Eismn.	fixed.	s&l..	Eismn.	150
Day-Elder D	2	2,600	144	Savg..	p-stl..	s-flex..	sol....	36x7	36x6	Jns...	wd....	Con...	4-4½x5½-27.2	4	cent...	Bush..	cst.....	Bush..	fin....	sing..	Eismn.	fixed.	s&l..	Eismn.	150
Day-Elder C	2½	2,850	150	Savg..	p-stl..	s-flex..	sol....	36x4	36x7	Jns...	wd....	Buda..	4-4½x5½-29.0	4	cent...	Bush..	cst.....	Bush..	fin....	sing..	Eismn.	fixed.	lghtg..	Eismn.	100
Day-Elder F	3½	3,550	165	Savg..	p-stl..	s-flex..	sol....	36x5	36x5d	Jns...	wd....	Con...	4-4½x5½-32.4	2	cent...	Bush..	cst.....	Bush..	fin....	sing..	Eismn.	fixed.	lghtg..	Eismn.	100
Day-Elder E	5	4,500	150	Savg..	p-stl..	s-flex..	sol....	36x5	40x6d	Jns...	wd....	Buda..	4-4½x6-32.4	2	cent...	Bush..	cst.....	Bush..	fin....	sing..	Berlg..	fixed.	lghtg..	Eismn.	100
Dearborn F	1½	1,980	126	own...	rol-c..	s-flex..	sol*...	34x4*	34x5*	.....	wd....	Con...	4-3½x5-19.6	4	ther...	.....	cst.....	.....	fin....	sing..	Bosch.	hand..	.....	.....	....
Dearborn BW	2	2,250	133	own...	rol-c..	s-flex..	sol....	34x4	34x5	.....	wd....	Buda..	4-3½x5½-22.5	4	ther...	Chgo..	cst.....	Chgo..	fin....	sing..	Bosch.	hand..	.....	.....	....
Defiance D	1½	.....	140	Drt...	p-stl	s-flex..	pnu...	35x5	36x6	Crn...	wd....	Con...	4-3½x5-22.5	4	cent...	Pfx..	cst.....	Pfx.	cel....	sing..	.....	hand..	s&l-2.	.....	none
Defiance E	2	.....	140	Drt...	p-stl..	s-flex..	pnu...	35x5	38x7	Crn...	wd....	Con...	4-3½x5-22.5	4	cent...	Pfx..	cst.....	Pfx.	cel....	sing..	.....	hand..	s&l-2.	.....	none
DeKalb E2	2	2,250	134	Prsh..	p-stl..	flex..	scl*...	34x3½*	36x5*	Sch...	wd....	Con...	4-4½x5½-27.2	4	cent...	Jck..	sht.....	Jck.	pln....	sing..	Eismn.	hand..	none..	none..	....
DeKalb E2½	2½	2,600	136	Prsh..	p-stl..	flex..	sol*...	36x4*	36x6*	Sch...	wd....	Con...	4-4½x5½-27.2	4	cent...	Jck..	sht.....	Jck.	pln....	sing..	Eismn.	hand..	none..	none..	....
Denby 12	1	1,950	124	Drt...	p-stl..	s-flex..	pnu...	35x5	36x6	.....	wd....	Con...	4-3½x5-19.6	4	ther...	Lng..	cst.....	Lng..	pln....	sing..	Eismn.	fixed.	none..	none..	....
Denby 134	2	2,450	144	Drt...	p-stl..	s-flex..	sol....	36x3½	36x6	.....	wd....	Con...	4-3½x5-22.5	4	ther...	Lng..	cst.....	Lng..	pln....	sing..	Eismn.	fixed.	none..	none..	....
Denby 25	3	3,250	150	Drt...	p-stl..	s-flex..	sol....	36x4	36x7	.....	mt....	Con...	4-4½x5½-27.2	4	cent...	Lng..	cst.....	Lng..	pln....	sing..	Eismn.	hand..	none..	none..	....
Denby 210	5	4,900	170	Drt...	p-stl..	s-flex..	sol....	36x6	40x12	.....	mt....	Con...	4-4½x5½-32.4	2	cent...	Lng..	cst.....	Lng..	pln....	sing..	Eismn.	hand..	none..	none..	....
Diamond-T T	1½	2,220	144	Smh..	p-stl..	.....	sol....	36x3½	36x5	.....	wd....	.....	4-3½x5½-22.5	4	cent...	.....	cst.....	G&O..	fin....	sing..	Bosch.	fixed.	.....	.....	....
Diamond-T FS	1½	2,445	144	Smh..	p-stl..	.....	sol....	36x3½	36x5	.....	wd....	.....	4-3½x5½-22.5	4	cent...	.....	cst.....	G&O..	fin....	sing..	Bosch.	fixed.	.....	.....	....
Diamond-T J4	1½	2,755	154	Smh..	p-stl..	.....	sol....	36x3½	36x5	.....	wd....	Con...	4-3½x5-22.5	4	ther...	.....	cst.....	G&O..	fin....	sing..	Bosch.	fixed.	.....	.....	....
Diamond-T J3	2	3,185	154	Smh..	p-stl..	.....	sol....	36x4	36x7	.....	wd....	Con...	4-4½x5½-27.2	4	cent...	.....	cst.....	G&O..	fin....	sing..	Bosch.	fixed.	.....	.....	....
Diamond-T LB	3½	4,390	170	Smh..	p-stl..	.....	sol....	36x5	36x5d	.....	wd....	Con...	4-4½x5½-32.4	2	cent...	.....	cst.....	G&O..	fin....	sing..	Bosch.	hand..	.....	.....	....
Diamond-T R	5	5,190	170	Smh..	p-stl..	.....	sol....	36x6	40x6d	.....	wd....	Con...	4-4½x5½-32.4	2	cent...	.....	cst.....	G&O..	fin....	sing..	Bosch.	hand..	.....	.....	....
Diamond-T S	5	5,660	180	Smh..	p-stl..	.....	sol....	36x6	40x6d	.....	wd....	own...	4-4½x6-36.2	2	cent...	.....	cst.....	G&O..	fin....	sing..	Bosch.	hand..	.....	.....	....
Dorris K-4	2½	3,285	144	Smh..	p-stl..	s-flex..	scl*...	36x4*	36x8*	Sth...	mt....	own...	4-4½x5½-29.0	4	cent...	own...	cst.....	McC..	fin....	sing..	Bosch.	hand..	s&l-2.	West..	175
Dorris K-7	3½	4,200	154	Smh..	p-stl..	s-flex..	sol*...	36x5*	36x10*	Sth...	mt....	own...	4-4½x5½-29.0	4	cent...	own...	cst.....	McC..	fin....	sing..	Bosch.	hand..	s&l-2.	West..	175
Douglas C	1	1,600	120	own...	rol-c..	.....	sol*...	34x5	35x5	own...	wd....	Buda..	4-3½x5½-22.0	4	cent...	own...	cst.....	.....	fin....	sing..	Eismn.	hand..	.....	.....	....
Douglas E	2½	2,525	136	own...	rol-c..	.....	sol*...	34x4	36x7	own...	wd....	Buda..	4-4½x5½-29.0	4	cent...	own...	cst.....	.....	fin....	sing..	Eismn.	hand..	.....	.....	....
Duplex E	3½	4,000	130	P&B..	p-stl..	rigid..	sol....	36x6	36x6	Prud..	wd....	Buda..	4-4½x5½-29.0	4	cent...	Lng..	prs.....	Lng..	fin....	sing..	Eismn.	hand..	opt..	opt..	....
Economy T-LHD	¾	1,250	128	.....	p-stl..	s-flex..	pnu...	35x5	35x5	Auto..	wd....	own...	4-3½x5½-21.2	4	cent...	own...	prs.....	own...	cel....	dual..	Aut-L.	hand..	sl&i...	Aut-L.	none
Elmira C	½	500	104	own...	rol-c..	s-flex..	pnu...	28x3	28x3	Mot..	wr....	Perk..	4-3¼x4-15.6	4	ther...	Bush..	prs.....	Bush..	cel....	sing..	A-Knt	hand..	lghtg..	Carl..	.65
Erie 1½	1½	.....	144	.....	p-stl..	.....	sol....	34x3½	36x5	.....	.....	Buda..	4-3½x5-27.2	1	.....	.....	.....	.....	fin....	.....	Bosch.	.....	opt....	.....	150
Erie 2	2	.....	150	.....	p-stl..	.....	sol....	34x3½	36x5	.....	.....	Buda..	4-4½x5½-27.2	1	.....	.....	.....	.....	fin....	.....	Bosch.	.....	.....	.....	....
Erie 2½	2½	.....	150	.....	p-stl..	.....	sol....	34x4	36x5	.....	.....	Buda..	4-4½x5½-27.2	1	.....	.....	.....	.....	fin....	.....	Bosch.	.....	.....	.....	....
Erie 3½	3½	.....	168	.....	p-stl..	.....	sol....	36x5	40x5d	.....	.....	Buda..	4-4½x5½-32.4	2	.....	.....	.....	.....	fin....	.....	Bosch.	.....	.....	.....	....
Fageol 2½	2½	3,400	144	own...	rol-c..	.....	sol....	34x4	36x7	Prud..	wd....	Wau..	4-4½x5½-29.0	2	cent...	own...	cst.....	Mod..	zz-t....	sing..	Spltf..	hand..	.....	.....	....
Fageol 3½	3½	4,500	172	own...	p-stl..	flex..	sol....	36x5	36x5d	Prud*.	wd*...	Wau..	4-	2	cent...	own...	cst.....	Mod..	zz-t....	sing..	Spltf..	hand..	.....	.....	....
Fageol 5	5	5,300	172	own...	p-stl..	.....	sol....	36x6	40x6d	Prud*.	wd*...	Wau..	4-4½x6½-32.4	2	cent...	own...	cst.....	Mod..	zz-t....	sing..	Spltf..	hand..	.....	.....	....

ABBREVIATIONS—Types of Construction

*—other options
amid—amidship
auto—automatic
bevl—bevel
cel—cellular
cent—centrifugal
chn—chain
cst—cast
ctr—center
cylinders cast, 2 in pairs
cylinders cast, 4 in block
cylinders cast, 3 in threes
cylinders cast, 1 singly
cyl-ends—cylinder-ends
d—dual
d-d—dry-disk
d-p—dry-plate
dplx—from both motor & driveshaft
d-rd—double reduction
d-s—drive-shaft
elec—electric
ext-d-s—external drive-shaft
ext-f-w—external front wheel
ext-g—external gear
ext-jst—external jack-shaft
ext-r-w—external rear wheel
fab—fabric
fin—finned tube
flex—flexible
fric—friction
g-p—gear pump
grv—gravity
gset—from gearset
hyd—hydraulic
ind-c—individual clutch
int-g—internal gear
int-g-4—internal gear drive on 4 wheels
int-r-w—internal rear wheel
jst—unit with jackshaft
l—left
l-b—loose ball
lghtg—lighting only
motr—unit with motor
mt—metal (wheels)
mtl—metal (universal joint)
opt—optional
pist—piston pump
plan—planetary
pln—plain tube
pnu—pneumatic
pres—pressure
prog—progressive
prs—pressed steel
p&s—pneumatics in front, solids in rear
p-stl—pressed steel
r—right
r&c—right & center
r-rd—radius rods
rol-c—rolled channel
rol-i—rolled I-beam
selec—selective
s-flex—semi-flexible
sht—sheet
s&l—starting & lighting
sl&i-2—starting, lighting & ignition, 2 unit
sol—solid
sprgs—springs
sq-t—square-tube
start—starting only
t-arm—torque arm
ther—thermo-syphon
t-p—two-point
t-t—torsion tube
vac—vacuum
wat-tube—water tube
wd—wood
w-d—multiple disk in oil
w-p—plate in oil
wr—wire
zz-t—zig-zag tube

ABBREVIATIONS—Makers of Parts

*Other Options
Acme—Acme Universal Joint Mfg. Co.
A-Knt—Atwater-Kent
Al-Ch—Allis-Chalmers
Aloy—Alloy Steel Spring
Amer—American Magneto Co.
Arch—Archibald
Arvac—Arvac Co.
Aut-L—Auto-Lite
Auto—Auto-Wheel Co.
A-W-W—Automotive Wire Wheel Co.
B&B—Ball & Ball
B-Beck—Borg & Beck
Berlg—Berling
Bet—Betts Spring Co.
Bim—Bimel
B-Lipe—Brown-Lipe
Blood—Blood Bros.
Brem—Bremer
Bvr—Beaver Mfg. Co.
B&W—B & W Mfg. Co.
Can—Candler Radiator
Cant—Canton-Cleveland
Carl—Carleton Co.
Cart—Carter Carburetor
Cas—G. M. Castle
CAS—C. A. S. Products
Chgo—Chicago Mfg. Co.
Chic—Chicago-Standard
Chmp—Champion Auto Spring Co.
Chy—Cheney
Clrk—Clark Equipment
Col—Columbia Axle Co.
Con—Continental Motor
Conn—Connecticut
Crn—Crane & Mac-Mahon Co.
C-S—Christopher Simpson Iron Co.
Day—Dayton
Del—Delaney
Detlaf—Detlaff

Gasoline Motor Trucks for 1920—Cont.

ENGINE									TRANSMISSION									Springs Make	BRAKES		CONTROL			UNIVERSALS		Name and Model
GOVERNOR			SPEED		FUEL SYS.		CLUTCH		GEARSET				FINAL DRIVE								STEERING GEAR					
Type	Make	Drive	Motor in r.p.m.	Truck in m.p.h.	Carbureter Make	Fuel Feed	Type	Make	Type	Make	Placed	Speeds	Type	Rear Axle Make	Total Gear Reduction	Propulsion Taken By	Torque Taken By		Foot	Hand	Placed	Make	Levers	Type	Make	
cent.	own...	motor	1200	18	Zenith.	grv...	d-d...	B-Lipe.	selec...	B-Lipe.	motr..	3	worm.	Timkn.	7.00	r-rd...	sprgs..	S-P...	int-r-w..	int-r-w	l...	Ross..	ctr..	mtl..	Spicer..	Clydesdale....42
cent.	own...	motor	1100	14	Zenith.	grv...	d-d...	B-Lipe.	selec...	B-Lipe.	amid..	4	worm.	Timkn.	8.50	r-rd...	sprgs..	S-P...	int-r-w..	int-r-w	l...	Ross..	ctr..	mtl..	Spicer..	Clydesdale....65X
cent.	own...	motor	1100	13	Zenith.	grv...	d-d...	B-Lipe.	selec...	B-Lipe.	amid..	4	worm.	Timkn.	10.33	r-rd...	sprgs..	S-P...	int-r-w..	int-r-w	l...	Ross..	ctr..	mtl..	Spicer..	Clydesdale....90
cent.	own...	motor	1100	10	Stmbg.	vac...	d-d...	B-Lipe.	selec...	B-Lipe.	amid..	4	worm.	Timkn.	11.67	r-rd...	sprgs..	S-P...	int-r-w..	int-r-w	l...	Ross..	ctr..	mtl..	Spicer..	Clydesdale....120B
suct..	Mnrch.	motor	.....	.....	Zenith.	vac...	d-d...	Fuller..	.....	Fuller..	motr..	3	worm.	.....	.....	.....	.....	.....	int-r-w..	int-r-w	l...	Ross..	ctr..	mtl..	D troit.	Collier....18
suct..	Mnrch.	motor	.....	.....	Zenith.	vac...	d-d...	Fuller..	.....	Fuller..	motr..	3	worm.	.....	.....	.....	.....	.....	int-r-w..	int-r-w	l...	Ross..	ctr..	mtl..	D troit.	Collier....19
suct..	Mnrch.	motor	.....	.....	Zenith.	vac...	d-d...	Fuller..	.....	Fuller..	motr..	4	worm.	.....	.....	.....	.....	.....	int-r-w..	int-r-w	l...	Ross..	ctr..	mtl..	D troit.	Collier....20
cent.	Pierce.	motor	1200	18	Stmbg.	grv...	d-d...	Detlaf..	selec...	Covert.	motr..	3	int-g..	Russl.	7.70	sprgs..	sprgs..	S-P...	int-r-w..	int-r-w	l...	own...	ctr..	mtl..	Spicer..	Columbia....F
cent.	Hink..	motor	1200	15	Stmbg.	vac...	d-d...	Detlaf..	selec...	Covert.	amid..	3	int-g..	Russl.	9.40	sprgs..	sprgs..	S-P...	ext-r-w..	int-r-w	l...	own...	ctr..	mtl..	Spicer..	Columbia....G
none.	none..	none..	2200	30	Zenith.	vac...	cone..	Detrt..	selec...	Detrt..	motr..	3	int-g..	Torbn..	7.10	sprgs..	sprgs..	Dtr...	ext-r-w..	int-r-w	l...	Jacox.	ctr..	mtl..	Spicer..	Commerce....E
none.	none..	none..	2200	30	Zenith.	vac...	cone..	Detrt..	selec...	Detrt..	motr..	3	int-g..	Torbn..	7.10	sprgs..	sprgs..	Dtr...	ext-r-w..	int-r-w	l...	Jacox.	ctr..	mtl..	Spicer..	Commerce....EP
suct..	Mnrch.	motor	1170	18	Zenith.	grv...	d-d...	B-Lipe.	selec...	B-Lipe.	motr..	3	worm.	Timkn.	7.75	sprgs..	sprgs..	S-P...	int-r-w..	int-r-w	l...	Ross..	ctr..	mtl..	Spicer..	Concord....A
suct..	Mnrch.	motor	1266	16	Zenith.	grv...	d-d...	B-Lipe.	selec...	B-Lipe.	motr..	3	worm.	Timkn.	8.50	sprgs..	sprgs..	S-P...	int-r-w..	int-r-w	l...	Ross..	ctr..	mtl..	Spicer..	Concord....B
.....	.....	.....	1800	25	Stmbg.	grv...	d-p...	B-Beck.	selec...	Muncie	motr..	3	int-g .	Torbn..	6.50	sprgs..	sprgs..	Iron..	ext-r-w..	int-r-w	l...	CAS..	ctr..	mtl..	Spicer..	Conestoga....12
.....	.....	.....	1350	17	Stmbg.	grv...	d-d...	Fuller..	selec...	Fuller..	motr..	3	worm.	Wis....	7.75	sprgs..	sprgs..	Iron..	int-r-w..	int-r-w	l...	Ross..	ctr..	mtl..	Sterl...	Conestoga....20
.....	Dplx..	.....	1350	14	Stmbg.	grv...	d-d...	Fuller..	selec...	Fuller..	motr..	3	worm.	Wis....	9.66	sprgs..	sprgs..	Iron..	int-r-w..	int-r-w	l...	Ross..	ctr..	mtl..	Sterl...	Conestoga....30
cent.	Dplx..	motor	1500	18	Stmbg.	vac...	d-d...	Fuller..	selec...	Fuller..	motr..	3	worm.	Shel...	6.50	sprgs..	sprgs..	Shel..	int-r-w..	int-r-w	l...	Lavn..	ctr..	mtl..	Hart...	Corbitt....E
cent.	Dplx..	motor	1200	18	Stmbg.	vac...	d-d...	Fuller..	selec...	Fuller..	motr..	3	worm.	Shel...	8.67	sprgs..	sprgs..	Shel..	int-r-w..	int-r-w	l...	Lavn..	ctr..	mtl..	Hart...	Corbitt....D
cent	Dplx..	motor	1200	16	Stmbg.	vac...	d-d...	B-Lipe.	selec...	B-Lipe.	motr..	3	worm.	Shel...	8.75	sprgs..	sprgs..	Shel..	int-r-w..	int-r-w	l...	Ross..	ctr..	mtl..	Hart...	Corbitt....C
cent.	Dplx..	motor	1200	16	Stmbg.	vac...	d-d...	B-Lipe.	selec...	B-Lipe.	motr..	4	worm.	Shel...	8.75	sprgs..	sprgs .	Shel..	int-r-w..	int-r-w	l...	Ross..	ctr..	mtl..	Hart...	Corbitt....B
cent.	Pierce..	motor	1100	14	Stmbg.	vac...	d-d...	B-Lipe.	selec...	B-Lipe.	motr..	4	worm.	Shel...	11.75	sprgs..	sprgs .	Shel..	int-r-w..	int-r-w	l...	Ross..	ctr..	mtl..	Hart...	Corbitt....A
cent.	Con....	motor	1000	11	Stmbg.	vac...	d-d...	Detlaf..	selec...	B-Lipe.	amid..	4	worm.	Shel...	11.75	sprgs..	sprgs..	Shel..	int-r-w..	int-r-w	l...	Ross..	ctr..	mtl..	Blood..	Corbitt....AA
none.	none...	.....	1280	10	Zenith.	grv...	d-d...	Covert.	selec...	Covert.	motr..	3	worm.	Wis....	7.75	sprgs..	sprgs..	Iron..	int-r-w..	int-r-w	l...	Ross..	ctr..	mtl..	Hart...	Day-Elder....A
none.	none...	.....	1250	15	Zenith.	grv...	d-d...	Covert.	selec...	Covert.	motr..	3	worm.	Wis....	8.33	sprgs..	sprgs..	Iron..	Int-r-w..	int-r-w	l...	Ross..	ctr..	mtl..	Hart...	Day-Elder....B
suct..	Mnrch.	motor	1000	14	Zenith.	grv...	d-d...	Covert.	selec...	Covert.	motr..	3	worm.	Wis....	7.67	sprgs..	sprgs..	Iron..	int-r-w..	int-r-w	l...	Ross..	ctr..	mtl..	Hart...	Day-Elder....D
suct..	Mnrch.	motor	950	14	Zenith.	grv...	d-d...	Covert.	selec...	Covert.	motr..	3	worm.	Wis....	8.67	sprgs..	sprgs..	Iron..	int-r-w..	int-r-w	l...	Ross..	ctr..	mtl..	Hart...	Day-Elder....C
suct..	Mnrch.	motor	900	12	Zenith.	grv...	d-d...	B-Lipe.	selec...	B-Lipe.	motr..	4	worm.	Wis....	10.10	sprgs..	sprgs..	Iron..	int-r-w..	int-r-w	l...	Ross..	ctr..	mtl..	Hart...	Day-Elder....F
suct..	Mnrch.	motor	800	10	Zenith.	grv...	d-d...	B-Lipe.	selec...	B-Lipe.	amid..	4	worm.	Shel...	8.75	sprgs..	sprgs..	Iron..	int-r-w..	int-r-w	l...	Ross..	ctr..	mtl..	Hart...	Day-Elder....E
.....	.....	.....	.....	.....	.....	vac...	d-d...	Fuller..	.....	Fuller..	motr..	3	worm.	Chic....	.....	sprgs.	sprgs..	.....	int-r-w..	int-r-w	l...	.....	ctr..	mtl..	Hart...	Dearborn....F
.....	.....	.....	.....	.....	Stmbg.	vac...	d-d...	B-Beck.	selec...	G-Lees.	motr..	3	worm.	Chic....	.....	sprgs.	sprgs..	.....	int-r-w..	int-r-w	l...	.....	ctr..	mtl..	Hart...	Dearborn....BW
none.	none...	.....	1700	25	Stmbg.	vac...	d-p...	B-Beck.	selec...	G-Lees.	motr..	3	int-g..	Torbn..	7.60	sprgs..	sprgs..	Dtr...	int-r-w..	int-r-w	l...	.....	ctr..	mtl..	.....	Defiance....D
none.	none...	.....	1800	25	Stmbg	vac...	d-p...	B-Beck.	selec...	G-Lees.	motr..	3	int-g..	Torbn..	9.10	sprgs..	sprgs..	Dtr...	int-r-w..	int-r-w	l...	own...	ctr..	mtl..	.....	Defiance....E
none.	none...	.....	1500	18	Mast...	grv...	d-d...	Fuller..	selec...	Fuller..	motr..	3	worm.	Timkn.	8.50	r-rd...	t-arm.	Mth..	int-r-w..	int-r-w	l...	Ross..	ctr..	mtl..	Hart...	DeKalb....E2
none.	none...	.....	1500	14	Mast...	grv...	d-d...	Fuller..	selec...	Fuller..	motr..	3	worm.	Timkn.	9.33	r-rd...	t-arm.	Mth..	int-r-w..	int-r-w	l...	Ross..	ctr..	mtl..	Hart...	DeKalb....E2½
suct..	Mnrch.	motor	.....	.....	Stmbg.	.....	d-d...	Fuller..	.....	Fuller..	.....	3	int-g..	Russl.	.....	.....	.....	Dtr...	.....	.....	l...	Ross..	.....	.....	Univl..	Denby....12
suct..	Mnrch.	motor	.....	.....	Stmbg.	.....	d-d...	Fuller..	.....	Fuller..	.....	4	int-g..	Russl.	.....	.....	.....	Dtr...	.....	.....	l...	Gem..	.....	.....	Univl..	Denby....134
suct..	Mnrch.	motor	.....	.....	Stmbg.	.....	d-d...	Fuller..	.....	Fuller..	.....	4	int-g..	Russl.	.....	.....	.....	Dtr...	.....	.....	l...	Gem..	.....	.....	Univl..	Denby....25
.....	Simp...	.....	.....	.....	Stmbg.	.....	d-d...	.....	.....	Warn..	.....	4	int-g..	Clrk...	.....	.....	.....	Dtr...	.....	.....	l...	Ross..	.....	.....	Univl..	Denby....210
.....	.....	.....	.....	18	Stmbg.	vac...	d-d...	.....	selec...	.....	motr..	3	worm.	.....	8.25	sprgs..	sprgs..	Mth..	int-r-w..	int-r-w	l...	.....	ctr..	mtl*.	Spicer*	Diamond-T....T
.....	.....	.....	.....	18	Stmbg.	vac...	d-d...	.....	selec...	.....	motr..	3	worm.	.....	8.25	sprgs..	sprgs..	Mth..	int-r-w..	int-r-w	l...	.....	ctr..	mtl*.	Spicer*	Diamond-T....FS
cent.	Pierce..	motor	.....	16	Stmbg.	grv...	d-d...	B-Lipe.	selec...	B-Lipe.	motr..	3	worm.	.....	7.75	sprgs..	sprgs..	Mth..	int-r-w..	int-r-w	l...	.....	ctr..	mtl*.	Spicer*	Diamond-T....J4
cent.	Pierce..	motor	.....	15	Stmbg.	grv...	d-d...	B-Lipe.	selec...	B-Lipe.	motr..	3*	worm.	.....	7.75*	sprgs..	sprgs..	Mth..	int-r-w..	int-r-w	l*	.....	ctr..	mtl*.	Spicer*	Diamond-T....J3
cent.	Pierce..	motor	.....	12	Stmbg.	grv...	d-d...	B-Lipe.	selec...	B-Lipe.	amid..	4	worm.	.....	8.75	sprgs..	sprgs..	Mth..	int-r-w..	int-r-w	l...	.....	ctr..	mtl..	Spicer..	Diamond-T....LB
cent.	Pierce..	motor	.....	10	Stmbg.	grv...	d-d...	B-Lipe.	selec...	B-Lipe.	amid..	4	worm.	.....	13.66	sprgs..	sprgs..	Mth..	int-r-w..	int-r-w	l...	.....	ctr..	mtl..	Spicer..	Diamond-T....R
cent.	Pierce..	motor	.....	10	Stmbg.	grv...	d-d...	B-Lipe.	selec...	B-Lipe.	amid..	4	worm.	.....	13.66	sprgs..	sprgs..	Mth..	int-r-w..	int-r-w	l...	.....	ctr..	mtl..	Spicer..	Diamond-T....S
cent.	own...	motor	1100	15	Stmbg.	grv...	d-d...	Warner	selec...	Warner	amid..	4	worm.	Timkn.	7.75	sprgs..	sprgs..	Mth..	int-r-w..	int-r-w	l...	Ross..	ctr..	mtl..	Spicer..	Dorris....K-4
cent.	own...	motor	1100	12	Stmbg.	grv...	d-d...	Warner	selec...	Warner	amid..	4	worm.	Timkn.	10.33	sprgs..	sprgs..	Mth..	int-r-w..	int-r-w	l...	Ross..	ctr..	mtl..	Spicer..	Dorris....K-7
cent.	.....	motor	1800	18	Schblr..	vac...	d-d...	Fuller..	selec...	Fuller..	motr..	3	int-g..	Torbn..	8.00	sprgs..	sprgs..	own...	ext-r-w..	int-r-w	l...	Ross..	ctr..	mtl..	Arvac..	Douglas....C
cent.	Pierce..	motor	1400	15	.....	vac...	d-d...	Fuller..	selec...	Fuller..	motr..	4	int-g..	Torbn..	4.00	sprgs..	sprgs..	own...	ext-r-w..	int-r-w	l...	Ross..	.....	mtl..	Arvac..	Douglas....E
cent.	Dplx...	dpl.	1120	15	Schblr..	vac...	d-d...	B-Lipe.	selec...	B-Lipe.	motr..	4	int-g-4	own....	38.4*	r-rd...	sprgs..	Tuth..	ext-d-s..	ext-r-w	l...	Wol...	ctr..	mtl..	Blood..	Duplex....E
none.	none...	none..	2200	35	Zenith.	vac...	cone..	own...	selec...	Warn..	motr..	3	int-g..	Torbn..	6.51	sprgs..	sprgs..	S-P...	ext-r-w..	int-r-w	l...	Jacox.	ctr..	mtl..	Hart...	Economy....T-LHD
none.	none...	.....	2200	35	Hol*...	grv...	cone..	own...	prog...	own...	amid..	2	bevel..	own...	3.60	sprgs..	sprgs..	Tuth..	int-r-w..	int-r-w	l...	own...	l...	mtl..	own...	Elmira....C
cent.	Pierce..	.....	.....	.....	Stmbg.	grv...	d-d...	.....	.....	.....	amid..	4	worm.	Timkn.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	Erie.....
cent.	Pierce..	.....	.....	.....	Stmbg.	grv...	d-d...	.....	.....	.....	amid..	4	worm.	Timkn.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	Erie.....
cent.	Pierce..	.....	.....	.....	Stmbg.	grv...	d-d...	.....	.....	.....	amid..	4	worm.	Timkn.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	Erie.....
cent.	Pierce..	.....	.....	.....	Stmbg.	grv...	.....	.....	.....	.....	amid..	4	worm.	Timkn.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	Erie.....
cent.	Wau...	motor	1000	20	Zenith.	grv...	d-d...	B-Lipe.	prog...	B-Lipe.	motr..	5	worm.	Timkn.	5.60	sprgs..	.....	Mth..	int-r-w..	int-r-w	l...	Ross..	ctr..	fab*.	Therm*	Fageol....2½
cent.	.....	motor	950	.....	Zenith.	vac...	d-d...	B-Lipe.	selec...	own...	amid..	5	worm.	Timkn.	7.47	r-rd...	t-arm.	Mth..	int-r-w..	int-r-w	l...	Ross..	ctr..	fab*.	Therm*	Fageol....3½
cent.	Wau...	motor	950	.....	Zenith.	vac...	d-d...	B-Lipe.	selec...	own...	amid..	5	worm.	Timkn.	9.85	r-rd...	t-arm.	Mth..	int-r-w..	int-r-w	l...	Ross..	ctr..	fab*.	Therm*	Fageol....5

ABBREVIATIONS—Makers of Parts—(Continued)—

Detrt—Detroit G. & M.
Ditw—Ditwiler Mfg. Co.
Dneto—Dyneto
Drt—Detroit Pressed Steel Co.
Dtr—Detroit Products
Dtrt—Detroit Lubricator
Dun—Dunbar Mfg. Co.
Dur—Durston Gear Corp.
E&M—English & Mersick
E&O—Eberly & Orris
Elsmn—Eisemann
Ens—Ensign Carburetor
Eric—Ericsson Mfg. Co.
Eurk—Eureka
F&H—French & Hecht
FAC—F. A. Chapper
Fed—Fedders
Flx—Flexo Mfg. Co.
Frank—Francke Co.
G&D—Gray & Davis
G&O—G & O Mfg. Co.
GCS—Garden City Springs
Gem—Gemmer
G-Lees—Grant-Lees
Grn—Greens Car Wheel
H&D—Hoopes Bros. & Darlington
Har—Harrison
Hart—Hartford
Harv—Harvey
Hay—Hayes Wheel Co.
Her—Hercules
Hig—Higgins
Hink—Hinkley
Hol—Holley
H-Shaw—Hele-Shaw
H-S—Herschell-Spillman
Hyd—Hydraulic
Idl—Ideal
Ind—Indestructible
Iron—Iron City
Jacox—Jackson-Church-Wilcox
Jck—Jackson Auto
Jns—Phineas Jones & Co.
John—Johnson Co.
Kal—Kalamazoo
Kel—Kelsey Wheel Co.
Ken—Kenosha Wheel & Knz—Kuntz
Lavn—Lavine
LeR—Le Roi
Lght—Light Mfg. Co.
L-N—Leece-Neville Co.
Lng—Long
Lvgn—Livingston
Lyc—Lycoming
Marvl—Marvel
Mas—F. C. Mason & Co.
Mast—Master
McCn—McCanna
M&E—Merchant & Evans
McC—McCord
Mech—Mechanics Mach. Co.
Merl—Merrill Spring Co.
Miller—H. A. Miller
Mnrch—Monarch
Mod—Modine Mfg. Co.
Mot—Mott Wheel Wks.
M-R—Marlin-Rockwell
MSC—Massillon
Mth—Mather
Mut—Mutual Wheel Co.
Nat—National Spring
Natl—National Can Co.
N-E—North East
Nich—Nichols Elec. Co.
P&B—Parish & Bingham
Perk—Perkins
Pet—Peters Mach. Co.
Pfx—Perfex Radiator
Phil—Philadelphia
Phro—Pharo Mfg. Co.
Prsh—Parish Mfg. Co.
Prud—Prudden
Rayfld—Rayfield
Rem—Remy
Rowl—Wm. H. Rowland
Roy—Royer Wheel Co.
R-T—Rome-Turney
Rugl—Ruggles
Rus—Russel Car & Frdy.
Russl—Russel Axle Co.
Rut—Rutenber
R&V—Root & VanDervoort
Sag—Saginaw
Sal—Salisbury
Savg—Savage Arms
Sch—Schwarz Wheel Co.
Schblr—Schebler
Shel—Sheldon
Simp—Simplex
S-J—Shotwell-Johnson
S-M—Standard Malleable
Smh—A. O. Smith
Sth—Smith Steel Wheel
S-P—Standard Parts Co.
Spltf—Splitdorf
Sp-P—Spring Perch Co.
Stan—Standard Radiator
Stand—Standard Steel Spring Co.
Sterl—Sterling Bearings
Stmbg—Stromberg
Stn—Standard Wheel Co.
S-W—Sparks-Withington
Sum—Sumter Elec. Co.
Therm—Thermoid
Timkn—Timken
Torbn—Torbensen
Tuth—Tuthill
Univl—Universal Prdts.
Unv—Universal
Unvsl—Universal Mach.
U. S.—U. S. Spring Co.
Wag—Wagner
Warn—Warner
Wau—Waukesha
West—Westinghouse
Wil-B—Wilcox Bennett
Wis—Wisconsin Parts
W-L—Ward-Leonard
W&L—Waterhouse & Lester Co.
Way—Wayne Wheel Co.
Wol—Wohlrab
Wsc—Wisconsin
Yng—Youngstown Pressed Steel Co.

Detailed Technical Specifications of

Name and Model	Tons Capacity	Chassis Price	Wheelbase, Inches	FRAME: Make	FRAME: Material	FRAME: Type	TIRES: Kind	TIRES: Size in Ins. Front	TIRES: Size in Ins. Rear	WHEELS: Make	WHEELS: Type	ENGINE: Make	ENGINE: No. Cyl. Bore and Stroke—N.A.C.C. Hp.	ENGINE: Cylinders Cast	ENGINE: COOLING: Water Circ.	ENGINE: COOLING: Radiator: CASE: Make	ENGINE: COOLING: Radiator: CASE: Type	ENGINE: COOLING: Radiator: CORE: Make	ENGINE: COOLING: Radiator: CORE: Type	ENGINE: IGNITION: Type	ENGINE: IGNITION: Make	ENGINE: IGNITION: Spark Advance	ENGINE: ELEC. SYSTEM: Type	ENGINE: ELEC. SYSTEM: Make	ENGINE: ELEC. SYSTEM: Extra Cost $
Famous B1C	1	$1,690	120	Savg	p-stl	flex	sol*	36x3½	36x4	Bim	wd	Con	4-3½x5-19.6	4	ther	Chgo	cst	Chgo	fin	sing	Eismn	fixed	lghtg	Eismn	120
Federal SD	1	2,300	132	Drt	p-stl	s-flex	pnu	35x5	36x6	Drt	mt	Con	4-3½x5-22.5	4	cent	own	prs	McC*	fin	sing	Eismn	fixed	lghtg*	Aut-L	none
Federal TE	1½	2,500	144	Drt	p-stl	s-flex	sol	36x3½	36x5	Sch*	wd	Con	4-4¼x5½-27.2	4	cent	own	prs	McC*	fin	sing	Eismn	fixed			
Federal UE	2	2,800	156	Drt	p-stl	s-flex	sol	36x4	36x7	Sch*	wd	Con	4-4¼x5½-27.2	4	cent	own	prs	McC*	fin	sing	Eismn	fixed			
Federal WD	3½	3,650	156	Drt	p-stl	s-flex	sol	36x5	36x5d	Sth	mt	Con	4-4½x5½-32.4	2	cent	own	prs	McC*	fin	sing	Eismn	fixed			
Federal XC	5	4,500	156	Rus	rol-c	s-flex	sol	36x6	40x6d	Sth	mt	Con	4-4½x5½-32.4	2	cent	own	prs	McC*	fin	sing	Eismn	fixed			
Federal Light Tractor		2,950	120	Drt	p-stl	s-flex	sol	36x4	36x7	Sch*	wd	Con	4-4¼x5½-27.2	4	cent	own	prs	McC*	fin	sing	Eismn	fixed	none	none	none
Federal Heavy Tractor		3,775	114½	Rus	rol-c	s-flex	sol	36x5	36x5d	Sth	mt	Con	4-4½x5½-32.4	2	cent	own	prs	McC*	fin	sing	Eismn	fixed	none	none	none
Ford TT	1	550	124	P&B	p-stl	flex	p&s	30x3½	32x3½	Prud*	wd	own	4-3½x4 -22.5	4	ther	own	sht	own	fin	sing	own	hand	lghtg		
Forschler AX	1½	2,375	120	own	rol-c	flex	sol*	36x3½	36x5	Sth	mt	Con	4-3½x 5-19.6	4	cent	own	cst	own	fin	sing	Bosch	fixed			
Forschler B	2	2,750	144	own	rol-c	flex	sol*	36x4	36x7	Sth	mt	Con	4-4¼x5½-27.2	4	cent	own	cst	own	fin	sing	Bosch	fixed			
Forschler BX	3	3,450	144	own	rol-c	flex	sol*	36x4	36x8	Sth	mt	Con	4-4¼x5½-27.2	4	cent	own	cst	own	fin	sing	Bosch	fixed			
F. W. D B	3	4,500	124	Prsh	p-stl	flex	sol*	36x6	36x6	Sch*	wd*	Wsc	4-4½x5½-36.2	2	cent	Lng	cst	Lng	fin	sing	Eismn	hand	s&l	N-E	350
Fulton A	1		130		p-stl		pnu				wd		4-3½x5 -19.6	4	ther							hand	s&l		
Fulton 0	2	2,350	137	P&B	p-stl	s-flex	sol	34x4	34x6	E&O	wd	H-S	4-3½x5 -16.9	4	ther	G&O	cst	G&O	zz-t	sing	Simms	hand	none	none	none
Gabriel C	1	2,000	136	Prsh	p-stl	s-flex	pnu	35x5	35x5	Stn	wd	Buda	4-4¼x5½-29.0	4	cent	G&O	cst	G&O	cel	sing	Bosch	hand	s&l-2	L-N	100
Gabriel E	2	3,250	156	Prsh	p-stl	s-flex	sol*	36x4*	36x7*	Stn	wd	Buda	4-4¼x5½-29.0	4	cent	G&O	cst	G&O	cel	sing	Bosch	hand	s&l-2	L-N	100
Gabriel F	4	4,300	180	Prsh	p-stl	s-flex	sol	36x5	40x6d*	Sth	mt	Buda	4-4½x6 -32.4	4	cent	G&O	cst	G&O	cel	sing	Bosch	hand	s&l-2	L-N	100
Garford 25	1½	2,090	135	own	p-stl	s-flex	sol	36x3½	36x4		wd	Buda	4-3½x5½-22.5	4	cent	own	cst		fin	sing	Splft	hand	s&i	West	125
Garford 70-H	2	3,190	144	own	p-stl	s-flex	sol*	36x4	36x7	Bim	wd	Buda	4-4¼x5½-29.0	4	cent	own	cst	own	fin	sing	Splft	hand	s&l	West	125
Garford 68	5	5,000	128	own	p-stl	s-flex	sol	36x6	40x6d	Sth	mt	Wsc	4-4½x5½-36.1	2	cent	own	cst	own	fin	dual	Eismn	hand	lghtg	West	125
Garford 69	6	5,300	128	own	p-stl	s-flex	sol	36x6	40x7d	Sth	mt	Wsc	4-5 1/8x5½-41.6	2	cent	own	cst	own	fin	dual	Eismn	hand	lghtg	West	125
Gary F	1	1,900	130	P&B	p-stl	rigid	sol	36x3½	36x4	Bim	wd	Buda	4-3¼x5 -16.9	4	cent	Chgo	cst	Chgo	fin	sing	Eismn	hand			
Gary GT	1	2,250	141	P&B	p-stl	rigid	sol	36x3½	36x5	Bim	wd	Buda	4-4 x5½-25.6	4	cent	Chgo	cst	Chgo	fin	sing	Eismn	hand			
Gary J	2	2,750	148	P&B	p-stl	rigid	sol	36x4	36x7	Bim	wd	Buda	4-4¼x5½-29.0	4	cent	Chgo	cst	Chgo	fin	sing	Eismn	hand			
Gary KT	3½	3,850	162	P&B	p-stl	rigid	sol	36x5	40x5d	Bim	wd	Buda	4-4¼x6 -32.4	4	cent	Chgo	cst	Chgo	fin	sing	Eismn	hand			
Gary M	5	4,850	182	P&B	p-stl	rigid	sol	36x6	40x6d	Day	mt	Buda	4-5 x6½-40.0	4	cent	Chgo	cst	Chgo	fin	sing	Eismn	hand			
G. M. C 16	¾	1,495	132	Smh	p-stl	s-flex	pnu	35x5	35x5		wd	Con	4-3¼x5 -22.5	4	cent	McC	prs	McC	fin	sing	Eismn	hand	sl&i-2	Delco	
G. M. C 21	1½	2,395	130	Smh	p-stl	s-flex	sol	36x3½	36x5	opt	wd	Con	4-3¼x5 -22.5	4	cent	McC	cst	McC	fin	sing	Eismn	hand	lghtg-2	Eismn	
G. M. C 41	2	2,725	144	Smh	p-stl	s-flex	sol	36x4	36x7	own	mt	Con	4-4¼x5½-27.2	4	cent	McC	cst	McC	fin	sing	Eismn	hand	lghtg-2	Eismn	
G. M. C 71	3½	3,750	163	own	rol-c	s-flex	sol	36x5	40x5d	own	mt	Con	4-4½x5½-32.4	2	cent	McC	cst	McC	fin	sing	Eismn	hand	lghtg-2	Eismn	
G. M. C 101	5	4,350	163	own	rol-c	s-flex	sol	36x6	40x6d		wd	Con	4-4½x5½-32.4	2	cent	McC	cst	McC	fin	sing	Eismn	hand	lghtg-2	Eismn	
Giant 15	1	1,950	138	Hyd	p-stl	s-flex	sol*	34x3½	34x5	Way	wd	Con	4-3¾x 5-22.5	4	ther	Idl	prs	Idl	cel	sing	Eismn	hand	none	none	none
Giant 14	1½		144	Hyd	p-stl	s-flex	sol*	34x3½	34x5	Way	wd	Buda	4-3¾x5½-22.5	4	ther	Idl	prs	Idl	cel	sing	Eismn	hand	none	none	none
Giant 16	2	2,850*	144*	Hyd	p-stl	s-flex	sol*	36x4	36x7	Way	wd	Con	4-4¼x5½-27.2	4	cent	own	cst	Idl	cel	sing	Eismn	hand	none	none	none
Giant 17	3½	3,850	176	own	rol-c	s-flex	sol	36x5	36x5d	Way	wd	Con	4-4½x5½-32.4	2	cent	own	cst	Jck	cel	sing	Eismn	hand	none	none	none
Grant 10	1½	1,885	124	Savg	p-stl	rigid	p&s	34x4½	34x5	Bim	wd	Con	4-3¾x 5-22.5	4	th r	Fed	sht	Fed	cel	dual		hand	sl&i-2	Remy	none
Grant 11	1½	1,935	140	Savg	p-stl	rigid	p&s	34x4½	34x5	Bim	wd	Con	4-3¾x 5-22.5	4	ther	Fed	sht	Fed	cel	dual	Splf	hand	sl&i-2	Remy	none
Grant 15	2	2,150	124	Savg	p-stl	rigid	sol*	34x4	34x6	Bim	wd	Con	4-3¾x 5-22.5	4	ther	Fed	sht	Fed	cel	dual	Splf	hand	sl&i-2	Remy	none
Grant 16	2	2,250	140	Savg	p-stl	rigid	pnu	34x4½	34x6	Bim	wd	Con	4-3¾x 5-22.5	4	ther	Fed	sht	Fed	cel	dual	Splf	hand	sl&i-2	Remy	none
Hal-Fur D	1	2,000	136	P&B	p-stl	s-flex	pnu	35x5	35x5	Stn	wd	Buda	4-4 x5 -25.6	4	cent	own	cst	G&O	fin	sing	Bosch	hand	sl&i	West	150
Hal-Fur B	2½	2,750	168	P&B	p-stl	s-flex	sol*	35x5	36x7	Msc	mt	Buda	4-4¼x5½-29.0	4	cent	own	cst	G&O	fin	sing	Bosch	hand	none	none	none
Harvey WEA	1½	2,350	128	own	p-stl	flex	sol	34x3½	34x5	Sch	wd	Buda	4-4½x5½-27.2	4	cent	Chgo	cst	Chgo	fin	sing	Bosch	fixed			
Harvey WFA	2½	3,300	150	own	rol-c	s-flex	sol	36x4	36x7	Sch	wd	Buda	4-4½x5½-29.0	4	cent	Chgo	cst	Chgo	fin	sing	Eismn	auto			
Harvey WHA	3½	4,300	160	own	rol-c	s-flex	sol	36x5	36x5d	Sch	wd	Buda	4-4½x 6-32.4	4	cent	Chgo	cst	Chgo	fin	sing	Eismn	auto			
Harvey WKA	5	5,000	160	own	rol-c	s-flex	sol	36x6	40x6d	Sth	mt	Buda	4-4½x 6-32.4	4	cent	Chgo	cst	Chgo	fin	sing	Eismn	auto			
Hawkeye K	1½	1,995	148½	own	rol-c	s-flex	sol*	34x3½	34x5	Bim	wd	Buda	4-3½x5½-22.5	4	cent	own	cst	Idl	zz-t	sing	Eismn	hand			
Hawkeye M	2	2,650	148½	own	rol-c	s-flex	sol*	36x4	36x6	Bim	wd	Buda	4-4¼x5½-29.0	4	cent	own	cst	Idl	zz-t	sing	Eismn	hand	lghtg	West	85
Highway-Knight A	4	4,800	159	Hyd	p-stl	flex	sol*	36x5	36x6d	Sch	wd	R&V	4-4 x6 -25.6	4	ther	own	cst	R-T	fin	sing	Eismn	hand	sl&i-2	Wag	none
Highway-Knight B	5	5,600	159	Hyd	p-stl	flex	sol	36x5	40x6d	Sch	wd	R&V	4-4 x6 -25.6	4	ther	own	cst	R-T	fin	sing	Eismn	hand	s&l-2	Wag	none
Huffman B	1½	1,895	140	Hyd	p-stl	s-flex	sol*	34x3½	34x4	Roy	wd	Con	4-3½x5 -16.9	4	ther	Lvgn	cst	Lvgn	cel	sing	Splf	hand			
Huffman C	1½	1.695	140	Hyd	p-stl	s-flex	sol*	34x3½	34x4	Roy	wd	Buda	4-3½x5 -16.9	4	ther	Lvgn	cst	Lvgn	cel	sing	Splf	hand			
Hurlburt	1½	2,850	148		p-stl		sol	34x4	34x5				4-4 x5½-25.6		cent							hand			
Hurlburt	2½	3,750	170		p-stl		sol	36x4	36x4d				4-4¼x5½-29.0		cent							hand			
Hurlburt	3½	4,400	156		p-stl		sol	36x5	36x5d				4-4½x6 -32.4		cent							hand			
Hurlburt	5	5,250	156		p-stl		sol	36x5	40x6d				4-4½x6 -32.4		cent							hand			

ABBREVIATIONS—Types of Construction

*—other options
amid—amidship
auto—automatic
bevl—bevel
cel—cellular
cent—centrifugal
chn—chain
cst—cast
ctr—center
cylinders cast, 2 in pairs
cylinders cast, 4 in block
cylinders cast, 3 in threes
cylinders cast, 1 singly
cyl-ends—cylinder-ends
d—dual
d-d—dry-disk
d-p—dry-plate
dplx—from both motor & driveshaft
d-rd—double reduction
d-s—drive-shaft
elec—electric
ext-d-s—external drive-shaft
ext-f-w—external front wheel
ext-g—external gear
ext-jst—external jack-shaft
ext-r-w—external rear wheel
fab—fabric
fin—finned tube
flex—flexible
fric—friction
g-p—gear pump
grv—gravity
gset—from gearset
hyd—hydraulic
ind-c—individual clutch
int-g—internal gear
int-g-4—internal gear drive on 4 wheels
int-r-w—internal rear wheel
jst—unit with jackshaft
l—left
l-b—loose ball
lghtg—lighting only
motr—unit with motor
mt—metal (wheels)
mtl—metal (universal joint)
opt—optional
pist—piston pump
plan—planetary
pln—plain tube
pnu—pneumatic
pres—pressure
prog—progressive
prs—pressed steel
p&s—pneumatics f\ front, solids in \w
p-stl—pressed steel
r—right
r&c—right & cent
r-rd—radius rods
rol-c—rolled channel
rol-i—rolled I-beam
selec—selective
s-flex—semi-flexible
sht—sheet
s&l—starting & lighting
sl&i-2—starting, lighting & ignition, 2 unit
sol—solid
sprgs—springs
sq-t—square-tube
start—starting only
t-arm—torque arm
ther—thermo-syphon
t-p—two-point
t-t—torsion tube
vac—vacuum
wat-tube—water tube
wd—wood
w-d—multiple disk in oil
w-p—plate in oil
wr—wire
z-z—zig-zag tube

ABBREVIATIONS—Makers of Parts

*Other Options
Acme—Acme Universal Joint Mfg. Co.
A-Knt—Atwater-Kent
Al-Ch—Allis-Chalmers
Aloy—Alloy Steel Spring
Amer—American Magneto Co.
Arch—Archibald
Arvac—Arvac Co.
Aut-L—Auto-Lite
Auto—Auto-Wheel Co.
A-W-W—Automotive Wire Wheel Co.
B&B—Ball & Ball
B-Beck—Borg & Beck
Berlg—Berling
Bet—Betts Spring Co.
Bim—Bimel
B-Lipe—Brown-Lipe
Blood—Blood Bros.
Brem—Bremer
Bvr—Beaver Mfg. Co.
B&W—B & W Mfg. Co.
Can—Candler Radiator
Cant—Canton-Cleveland
Carl—Carleton Co.
Cart—Carter Carburetor
Cas—G. M. Castle
CAS—C. A. S. Products
Chgo—Chicago Mfg. Co.
Chic—Chicago-Standard
Chmp—Champion Auto Spring Co.
Chy—Cheney
Clrk—Clark Equipment
Col—Columbia Axle Co.
Con—Continental Motor
Conn—Connecticut
Crn—Crane & Mac-Mahon Co.
C-S—Christopher Simpson Iron Co.
Day—Dayton
Del—Delaney
Detlaf—Detlaff

Gasoline Motor Trucks for 1920—Cont.

ENGINE									TRANSMISSION										BRAKES		CONTROL			UNIVERSALS		Name and Model
GOVERNOR			SPEED		FUEL SYS.		CLUTCH		GEARSET				FINAL DRIVE					Springs Make			STEERING GEAR					
Type	Make	Drive	Motor in r.p.m.	Truck in m.p.h.	Carbureter Make	Fuel Feed	Type	Make	Type	Make	Placed	Speeds	Type	Rear Axle Make	Total Gear Reduction	Propulsion Taken By	Torque Taken By		Foot	Hand	Placed	Make	Levers	Type	Make	
suct..	Mnrch..	motor	1350	18	Stmbg.	vac...	d-d...	Fuller..	selec...	Fuller..	motr..	3	int-g..	Clrk...	7.00	sprgs..	sprgs..	Shel...	ext-d-s..	ext-r-w..	l...	Ross..	ctr..	mtl..	Sterl...	Famous B1
cent.	Pharo..	motor	1450	25	Zenith.	vac...	d-p...	B-Beck.	selec...	own...	amid..	3	worm.	Timkn.	6.20	r-rd...	sprgs..	Mth..	int-r-w..	int-r-w..	l...	Gem..	ctr..	mtl..	Peters..	Federal SI
cent.	Pharo..	motor	1190	15	Zenith.	grv...	d-p...	B-Beck.	selec...	Detrt..	amid..	4	worm.	Timkn.	8.50	r-rd...	sprgs..	Mth..	int-r-w..	int-r-w..	l...	Gem..	ctr..	mtl..	Spicer..	Federal TI
cent.	Pharo..	motor	1125	13	Zenith.	grv...	d-p...	B-Beck.	selec...	Detrt..	amid..	4	worm.	Timkn.	9.25	r-rd...	sprgs..	Mth..	int-r-w..	int-r-w..	l...	Gem..	ctr..	mtl..	Spicer..	Federal UI
cent.	Pharo..	motor	1150	12	Zenith	grv...	d-p...	B-Beck.	selec...	Warn..	amid..	4	worm.	Tmkn..	10.33	r-rd...	sprgs..	Mth..	int-r-w..	int-r-w..	l...	Gem..	ctr..	mtl..	Spicer..	Federal WI
cent.	Pharo..	motor	1150	10	Zenith	grv...	d-p...	B-Beck.	selec...	Warn..	amid..	4	worm.	Tmkn..	13.66	r-rd...	sprgs..	Mth..	int-r-w..	int-r-w..	l...	Gem..	ctr..	mtl..	Spicer..	Federal XC
cent.	Pharo..	motor	1125	13	Zenith	grv...	d-p...	B-Beck.	selec...	Detrt..	amid..	4	worm.	Timkn.	9.25	r-rd...	sprgs..	Mth..	int-r-w..	int-r-w..	l...	Gem..	ctr..	mtl..	Spicer..	Federal.. Light Tracto
cent.	Pharo..	motor	1150	12	Zenith.	grv...	d-p...	B-Beck.	selec...	Warn..	amid..	4	worm.	Timkn.	12.00	r-rd...	sprgs..	Mth..	int-r-w..	int-r-w..	l...	Gem..	ctr..	mtl..	Spicer..	Federal.. Heavy Tracto
.....	.....	.....	1373	18	own...	grv...	w-d...	own...	plan...	own...	motr..	2	worm.	own...	7.25	r-rd...	t-t...	Mth*.	ext-d-s..	int-r-w..	l...	own...	l...	mtl..	own...	Ford T
cent.	Dplx...	dplx...	1200	16	Zenith.	grv...	d-d...	Fuller..	selec...	Fuller..	motr..	3	worm.	Shel....	7.80	sprgs..	sprgs..	own...	int-r-w..	int-r-w..	l...	Ross..	ctr..	mtl..	own...	Forschler A
cent.	Dplx...	dplx...	1200	12	Zenith.	grv...	d-d...	Fuller..	selec...	Fuller..	motr..	3	worm.	Shel...	8.66	sprgs..	sprgs..	own...	int.....	int.....	l...	Ross..	ctr..	mtl..	own...	Forschler I
cent	Dplx...	dplx...	1200	12	Zenith.	grv...	d-d...	Fuller..	selec...	Fuller..	motr..	4	worm.	Shel...	8.75	sprgs..	sprgs..	own...	int-r-w..	int-r-w..	l...	Ross..	ctr..	mtl..	own...	Forschler B
cent.	Pierce..	motor	1350	15	Stmbg	grv...	w-d...	H-Shaw	ind-c...	Cotta...	amid..	3	bevel-i	own...	8.90	sprgs..	sprgs..	Tuth..	ext-d-s..	ext-r-w..	r...	Ross..	r...	mtl..	Blood..	F. W. D I
.....	.....	.....	2000	.....	.....	.....	d-d...	B-Beck.	.....	.....	motr..	3	int-g.	.....	.....	.....	.....	.....	ext-r-w..	ext-d-s..	l*..	.....	.....	.....	.....	Fulton
cent	Pierce..	motor	3200	35	Cart...	grv...	d-p...	B-Beck.	selec...	Dur...	motr..	3	int-g..	Russl..	10.20	sprgs..	sprgs..	Rowl.	ext-r-w..	ext-d-s..	l...	Lavn..	ctr..	mtl..	Univl..	Fulton
none.	none...	.....	1200	25	Rayfld.	grv...	d-p...	B-Beck.	selec...	B-Lipe.	amid..	3	worm.	Timkn.	.....	r-rd...	t-arm.	Merl..	int-r-w..	int-r-w..	l...	Gem..	ctr..	mtl..	Spicer..	Gabriel
cent.	Dplx...	motor	1100	18	Rayfld.	grv...	d-p...	B-Beck.	selec...	B-Lipe.	amid..	4	worm.	Timkn.	.....	r-rd...	sprgs..	Merl..	int-r-w..	int-r-w..	l...	Gem..	ctr..	mtl..	Spicer..	Gabriel
cent.	Dplx...	motor	1000	12	Rayfld.	grv...	d-p...	B-Beck.	selec...	B-Lipe.	amid..	4	worm.	Timkn.	.....	r-rd...	sprgs..	Merl..	int-r-w..	int-r-w..	l...	Gem..	ctr..	mtl..	Spicer..	Gabriel
cent..	Mnrch.	motor	1300	18	Stmbg.	grv...	d-d...	B-Lipe.	selec...	own...	amid..	3	worm.	Timkn.	7.75	sprgs..	sprgs..	S-P..	int-r-w..	int-r-w..	l...	Ross..	ctr..	mtl..	Spicer..	Garford 2
cent.	Dplx...	motor	1085	15	Rayfld.	grv...	d-d...	B-Lipe.	selec...	own...	amid..	4	worm.	Timkn.	7.75	sprgs..	sprgs..	S-P..	int-r-w..	int-r-w..	r...	Ross..	ctr..	mtl..	Spicer..	Garford 70-1
cent.	Dplx...	motor	1057	11	Rayfld.	grv...	d-d...	B-Lipe.	selec...	own...	amid..	4	chn...	own....	11.44	r-rd...	.....	S-P..	ext-d-s..	int-r-w..	r...	Ross..	ctr..	mtl..	Spicer..	Garford 6
cent.	Dplx...	motor	1057	10	Rayfld.	grv...	d-d...	B-Lipe.	selec...	own...	amid..	4	chn...	own....	12.39	r-rd...	.....	S-P..	ext-d-s..	int-r-w..	r...	Ross..	ctr..	mtl..	Spicer..	Garford 6
cent.	Pierce..	motor	1000	15	Mast...	grv...	d-d...	Fuller..	selec...	Fuller..	motr..	3	worm.	Timkn.	.....	sprgs..	sprgs..	Tuth..	int-r-w..	int-r-w..	l...	Lavn..	ctr..	mtl..	Blood..	Gary
cent.	Pierce..	motor	1000	15	Mast...	grv...	d-d...	Fuller..	selec...	Fuller..	motr..	3	worm.	Timkn.	7.25	sprgs..	sprgs..	Tuth..	int-r-w..	int-r-w..	l...	Ross..	ctr..	mtl..	Blood..	Gary G
.....	McCn..	motor	1000	15	Mast...	grv...	d-d...	Fuller..	selec...	Fuller..	motr..	4	worm.	Timkn.	8.50	sprgs..	sprgs..	Tuth..	int.....	int.....	l...	Ross..	ctr..	mtl..	Spicer..	Gary
.....	McCn..	motor	1000	15	Mast...	grv...	d-d...	B-Lipe.	selec...	B-Lipe.	amid.	4	worm.	Timkn.	10.33	sprgs..	sprgs..	Detr..	int.....	int.....	l...	Ross..	ctr..	mtl..	Spicer..	Gary K
.....	McCn..	motor	1000	15	Mast...	grv...	d-d...	B-Lipe.	selec...	B-Lipe.	amid..	4	worm.	Timkn.	11.66	sprgs..	sprgs..	Detr..	int-r-w..	int-r-w..	l...	Ross..	ctr..	mtl..	Spicer..	Gary M
suct..	Mnrch.	motor	1150	20	Marvl..	grv...	d-d...	own...	selec...	own...	motr..	3	bevel..	own...	6.00	r-rd...	sprgs..	Detr..	ext-r-w..	int-r-w..	l...	own..	ctr..	mtl..	Unvsl..	G. M. C 1
suct..	Mnrch.	motor	1300	15	Marvl..	grv...	d-d...	own...	selec...	own.	motr..	4	worm.	timkn..	9.25	r-rd	sprgs..	Detr	int-r-w..	int-r-w..	l.	own.	ctr..	mtl..	own.	G. M. C 2
suct.	Mnrch.	motor	1210	14	Marvl..	grv...	d-d...	own...	selec...	own.	motr.	4	worm.	Timkn.	9.25	r-rd	sprgs..	Detr	int-r-w..	int-r-w..	l.	own.	ctr..	mtl..	own.	G. M. C 4
suct.	Mnrch.	motor	1210	12	Marvl..	grv...	d-d...	own...	selec...	own.	amid..	4	worm.	Timkn.	12.00	r-rd..	sprgs..	Detr	int-r-w..	int-r-w..	l.	own.	ctr..	mtl..	own.	G. M. C 7
suct.	Mnrch.	motor	1150	10	Marvl..	grv...	d-d...	own...	selec...	own.	amid..	4	worm.	Timkn.	13.67	r-rd	sprgs..	Detr	int-r-w..	int-r-w..	l.	own.	ctr..	mtl..	own.	G. M. C 10
cent.	Pierce..	motor	2000	26	Schblr.	grv...	d-d...	B-Lipe.	selec...	B-Lipe.	motr..	3	worm.	Shel. .	7.80	sprgs..	sprgs..	Shel..	int-r-w..	int-r-w..	r...	Jacox.	ctr..	mtl..	Spicer..	G ant 1
cent*	Pierce*	motor*	2000	26	Schblr.	grv...	d-d...	B-Lipe.	selec...	B-Lipe.	motr..	3	worm.	Shel. .	7.80	sprgs..	sprgs..	Shel..	int-r-w..	int-r-w..	l...	Ross .	ctr.	mtl..	Spicer..	Giant 1
cent.	Pierce..	motor	1500	21	Schblr.	grv...	d-d...	B-Lipe.	selec...	B-Lipe.	motr..	3	worm.	Shel...	8.66	sprgs..	sprgs..	Shel..	int-r-w..	int-r-w..	r...	Ross .	ctr..	mtl..	Spicer..	Giant 1
cent.	Pierce..	motor	1500	15	Stmbg.	grv...	d-d...	B-Lipe.	selec...	B-Lipe.	amid..	4	worm.	Shel...	10.25	sprgs..	sprgs..	Shel..	int-r-w..	int-r-w..	r...	Ross .	ctr..	mtl..	Spicer..	Giant 1
cent.	Pierce..	d-s. ..	1100	16	Carter.	vac...	d-p...	B-Beck.	selec...	G-Lees	motr..	3	int-g .	Torbn..	7.00	sprgs..	sprgs..	S-P .	ext-r-w..	int-r-w..	.....	Jacox.	ctr..	mtl..	Arvac	Grant 1
cent.	Pierce..	d-s. ..	1100	16	Carter.	vac...	d-p...	B-Beck.	selec...	G-Lees	motr..	3	int-g .	Torbn..	7.00	sprgs..	sprgs..	S-P .	ext-r-w..	int-r-w..	.....	Jacox.	ctr..	mtl..	Arvac	Grant 1
cent.	Pierce..	d-s. ..	1100	14	Carter.	vac...	d-p...	B-Beck.	selec...	G-Lees	motr..	3	int-g .	Torbn..	8.00	sprgs..	sprgs..	S-P .	ext-r-w..	int-r-w..	.....	Jacox.	ctr..	mtl..	Arvac	Grant 1
cent.	Pierce..	d-s. ..	1100	14	Carter.	vac...	d-p...	B-Beck.	selec...	G-Lees	motr..	3	int-g .	Torbn..	8.00	sprgs..	sp gs..	S-P .	ext-r-w..	int-r-w..	.....	Jacox.	ctr..	mtl..	Arvac	Grant 1
cent.	Dplx	motor	1400	25	Stmbg.	grv...	d-p...	B-Beck.	selec...	B-Lipe.	motr..	4	worm.	Timkn..	6.35	r rd	sprgs..	S-P...	int-r-w..	int-r-w..	l...	Gem .	ctr..	mtl..	Peters..	Hal-Fur
cent.	Dplx...	motor	1200	18	Stmbg.	grv...	d-p...	B-Beck	selec...	B-Lipe.	amid..	4	worm.	Timkn.	7.00	r rd...	sprgs..	S-P...	int-r-w..	int-r-w..	l...	Gem .	ctr..	mtl..	Peters..	Hal-Fur
suct.	Mnrch.	motor	1100	16	Zenith.	grv...	d-d...	Fuller..	selec...	Fuller..	motr .	3	worm.	Shel...	7.75	sprgs..	sprgs..	Shel...	int-r-w..	int-r-w..	l...	Ross .	ctr..	mtl..	Arvac	Harvey WE
cent	Dplx...	moto	1100	16	Stmbg	grv...	d-p...	B-Beck.	selec...	B-Lipe.	amid..	4	worm.	Shel...	7.75	sprgs..	sprgs..	Shel...	int-r-w..	int-r-w..	l...	Ross .	ctr..	mtl..	Spicer..	Harvey WF
cent.	Dplx...	motor	1000	13	Stmbg	grv...	d-p...	B-Beck.	selec...	B-Lipe.	amid..	4	worm.	She'....	8.75	sprgs .	sprgs .	Shel...	int-r-w..	int-r-w..	l...	Ross.	ct ..	mtl..	Sp cer..	Harvey WH
cent.	Dplx...	mo or	900	11	Stmbg.	grv...	d-p...	B-Beck.	selec...	B-Lipe.	amid..	4	worm.	Shel....	8.75	sprgs..	sprgs .	Shel...	int-r-w..	int-r-w..	l...	Ross.	ctr .	mtl..	Spic r..	Harvey WK
cent.	Simp...	motor	1145	16	Zenith.	grv...	d-p...	Fuller..	selec...	Fuller..	motr..	3	int-g..	Clrk...	7.60	sprgs..	sprgs .	Detr..	ext-r-w..	int-r-w..	l...	Ross..	ctr .	mtl..	Hart..	Hawkeye
cent.	Simp...	motor	1150	16	Zenith.	grv...	d-d...	Fuller..	selec...	Fuller..	motr..	4	int-g..	Clrk...	8.00	sprgs..	prgs..	Detr..	ext-d-s..	int-r-w..	l...	Ross..	ctr..	mtl..	Hart..	Hawkeye
suct..	Mnrch.	motor	1500	19	Zenith.	vac...	d-d...	B-Lipe.	selec...	own...	amid..	4	worm.	Shel....	8.75	sprgs..	sprgs..	Shel...	int-r-w..	int-r-w..	l...	.....	ctr..	fab..	Therm.	Highway-Knight
suct..	Mnrch.	motor	1200	15	Zenith.	vac...	d-d...	B-Lipe.	selec...	own...	amid..	4	worm.	Shel....	10.20	sprgs..	sprgs..	Shel...	int-r-w..	int-r-w..	l...	.....	ctr..	fab..	Therm.	Highway-Knight
.....	.....	.....	.....	.....	Zenith.	grv...	d-d...	Fuller..	selec...	Fuller..	motr..	3	worm.	Chic...	8.00	sprgs..	sprgs..	S-P...	int-r-w..	int-r-w..	l...	Lavn..	ctr..	mtl..	Hart..	Huffman
.....	.....	.....	.....	.....	Zenith.	grv...	d-d...	Fuller..	selec...	Fuller..	motr..	3	int-g..	Torbn..	8.00	sprgs..	sprgs..	S-P...	int-r-w..	int-r-w..	l...	Lavn..	ctr..	mtl..	Hart..	Huffman
.....	.....	.....	.....	18	.....	.....	d-d...	.....	selec...	.....	motr..	3	worm.	.....	.....	.....	.....	.....	int-r-w..	int-r-w..	.....	.....	.....	.....	.....	Hurlburt
.....	.....	.....	.....	16	.....	.....	d-d...	.....	selec...	.....	motr..	3	worm.	.....	.....	.....	.....	.....	ext-r-w..	int-r-w..	.....	.....	.....	.....	.....	Hur burt
.....	.....	.....	.....	13	.....	.....	d-d...	.....	selec...	.....	amid..	4	worm.	.....	.....	.....	.....	.....	ext-r-w..	int-r-w..	.....	.....	.....	.....	.....	Hurlburt
.....	.....	.....	.....	12	.....	.....	d-d...	.....	selec...	.....	amid.	4	worm.	.....	.....	.....	.....	.....	ext-r-w..	int-r-w..	.....	.....	.....	.....	.....	Hurlburt

ABBREVIATIONS—Makers of Parts—(Continued)—

Detrt—Detroit G. & M.
Ditw—Ditwiler Mfg. Co.
Dneto—Dyneto
Drt—Detroit Pressed Steel Co.
Dtr—Detroit Products
Dtrt—Detroit Lubricator
Dun—Dunbar Mfg. Co.
Dur—Durston Gear Corp.
E&M—English & Mersick
E&O—Eberly & Orris
Eismn—Eisemann
Ens—Ensign Carburetor
Eric—Ericsson Mfg. Co.
Eurk—Eureka
F&H—French & Hecht
FAC—F. A. Chapper
Fed—Fedders
Flx—Flexo Mfg. Co.
Frank—Francke Co.
G&D—Gray & Davis
G&O—G & O Mfg. Co.
GCS—Garden City Springs
Gem—Gemmer
G-Lees—Grant-Lees
Grn—Greens Car Wheel
H&D—Hoopes Bros. & Darlington
Har—Harrison
Hart—Hartford
Harv—Harvey
Hay—Hayes Wheel Co.
Her—Hercules
Hig—Higgins
Hink—Hinkley
Hol—Holley
H-Shaw—Hele-Shaw
H-S—Herschell-Spillman
Hyd—Hydraulic
Idl—Ideal
Ind—Indestructible
Iron—Iron City
Jacox—Jackson-Church-Wilcox
Jck—Jackson Auto
Jns—Phineas Jones & Co.
John—Johnson Co.
Kal—Kalamazoo
Kel—Kelsey Wheel Co.
Ken—Kenosha Wheel & Knz—Kuntz
Lavn—Lavine
LeR—Le Roi
Lght—Light Mfg. Co.
L-N—Leece-Neville Co.
Lng—Long
Lvgn—Livingston
Lyc—Lycoming
Marvl—Marvel
Mas—F. C. Mason & Co.
Mast—Master
McCn—McCanna
M&E—Merchant & Evans
McC—McCord
Mech—Mechanics Mach. Co.
Merl—Merrill Spring Co.
Miller—H. A. Miller
Mnrch—Monarch
Mod—Modine Mfg. Co.
Mot—Mott Wheel Wks.
M-R—Marlin-Rockwell
MSC—Massillon
Mth—Mather
Mut—Mutual Wheel Co.
Nat—National Spring
Natl—National Can Co.
N-E—North East
Nich—Nichols Elec. Co.
P&B—Parish & Bingham
Perk—Perkins
Pet—Peters Mach. Co.
Pfx—Perfex Radiator
Phil—Philadelphia
Phro—Pharo Mfg. Co.
Prsh—Parish Mfg. Co.
Prud—Prudden
Rayfld—Rayfield
Rem—Remy
Rowl—Wm. H. Rowland
Roy—Royer Wheel Co.
R-T—Rome-Turney
Rugl—Ruggles
Rus—Russel Car & Frdy.
Russl—Russel Axle Co.
Rut—Rutenber
R&V—Root & VanDervoort
Sag—Saginaw
Sal—Salisbury
Savg—Savage Arms
Sch—Schwarz Wheel Co.
Schblr—Schebler
Shel—Sheldon
Simp—Simplex .
S-J—Shotwell-Johnson
S-M—Standard Malle-
Smh—A. O. Smith
Sth—Smith Steel Wheel
S-P—Standard Parts Co.
Spltf—Splitdorf
Sp-P—Spring Perch Co.
Stan—Standard Radiator
Stand—Standard Steel Spring Co.
Sterl—Sterling Bearings
Stmbg—Stromberg
Stn—Standard Wheel Co.
S-W—Sparks-Withington
Sum—Sumter Elec. Co.
Therm—Thermoid
Timkn—Timken
Torbn—Torbensen
Tuth—Tuthill
Univl—Universal Prdts
Unv—Universal
Unvsl—Universal Mach.
U. S.—U. S. Spring Co.
Wag—Wagner
Warn—Warner
Wau—Waukesha
West—Westinghouse
Wil-B—Wilcox Bennett
Wis—Wisconsin Parts
W-L—Ward-Leonard
W&L—Waterhouse & Lester Co.
Way—Wayne Wheel Co.
Wol—Wohlrab
Wsc—Wisconsin
Yng—Youngstown Pressed Steel Co.

Detailed Technical Specifications of

Name and Model	Tons Capacity	Chassis Price	Wheelbase, Inches	FRAME: Make	FRAME: Materia	FRAME: Type	TIRES: Kind	TIRES: Size in Ins. Front	TIRES: Size in Ins. Rear	WHEELS: Make	WHEELS: Type	ENGINE: Make	ENGINE: No. Cyl. Bore and Stroke—N.A.C.C. Hp.	ENGINE: Cylinders Cast	ENGINE: Cooling: Water Circ.	ENGINE: Cooling: Radiator: Case: Make	ENGINE: Cooling: Radiator: Case: Type	ENGINE: Cooling: Radiator: Core: Make	ENGINE: Cooling: Radiator: Core: Type	IGNITION: Type	IGNITION: Make	IGNITION: Spark Advance	ELEC. SYSTEM: Type	ELEC. SYSTEM: Make	ELEC. SYSTEM: Extra Cost $
dependent (Iowa)...E	1½	$1,890	135	own...	rol-c..	rigid..	sol*...	34x3½	34x5	Prud..	wd....	Con...	4-3½x5 -22.5	4	cent...	Chgo..	cst.....	Chgo..	cel.....	sing...	Bosch.	fixed..	none..	none..	none
dependent (Iowa)...F	2	2,290	146	own...	rol-c..	rigid..	sol*...	34x4	34x6	Prud..	wd....	Con...	4-4½x5½-27.2	4	cent...	Chgo..	cst.....	Chgo..	cel.....	sing...	Bosch.	fixed..	none..	none..	none
dependent (Ohio)...F	1	1,685	128	P&B..	p-stl..	s-flex..	sol*...	34x3½	34x4	Way*.	wd*...	Con...	4-3½x5 -19.6	4	ther...	Natl..	sht.....	Natl..	zz-t....	sing...	Eismn.	fixed..	lghtg..	Exide.	none
dependent (Ohio)...G	2	2,500	144	P&B..	p-stl..	s-flex..	sol*...	34x4	34x6	Ind...	mt.....	Con...	4-4½x5½-27.2	4	cent...	Yng...	prs.....	Lng...	fin.....	sing...	Eismn.	fixed..	lghtg..	Exide.	none
diana.....12	1½	2,300	134	own...	rol-c..	s-flex..	sol*...	34x3½	34x5	Bim...	wd....	Wau...	4-3½x5½-22.5	4	cent...	Lng...	cst.....	Lng...	fin.....	sing...	Eismn.	hand..	s&l-2*	West..	175
diana.....20	2	2,950	150	own...	rol-c..	s-flex..	sol*...	36x4	36x7	Bim...	wd....	own...	4-4½x5½-27.2	2	cent...	Lng...	cst.....	Lng...	fin.....	sing...	Eismn.	hand..	s&l-2*	West..	175
diana.....25	2½	3,150	156	own...	rol-c..	s-flex..	sol*...	36x4	36x8	Bim...	wd....	own...	4-4½x5½-27.2	2	cent...	Lng...	cst.....	Lng...	fin.....	sing...	Eismn.	hand..	s&l-2*	West..	175
diana.....35	3½	3,750	160	own...	rol-c..	s-flex..	sol*...	36x5	36x5d	Sth...	mt.....	own...	4-4½x5½-30.6	2	cent...	Lng...	cst.....	Lng...	fin.....	sing...	Eismn.	hand..	s&l-2*	West..	175
diana.....50	5	4,800	170	own...	rol-c..	s-flex..	sol*...	36x5	40x6d	Sth...	mt.....	Wau...	4-4½x6½-36.1	2	cent...	Lng...	cst.....	Lng...	fin.....	dual..	Eismn.	hand..	s&l-2*	West..	175
land.....C	1½	1,950	136	.....	rol-c..	.....	p&s...	34x4	34x5	.....	wd....	.....	4-3½x4½-22.5	.....	ther...	.....	sht.....	.....	.....	.....	Bosch.	.....	s&l-2..	Dneto.	none
land.....D	2	2,850	132	.....	rol-c..	.....	.....	34x5	34x6	Bim...	wd....	wse...	4-4 x5 -25.6	.....	.....	Lng...	.....	Lng...	fin.....	.....	Spltf..	.....	none..	none..	none
H. C.....F	1	1,850	128	P&B..	p-stl..	s-flex..	sol....	36x3½	36x4	opt...	wd....	own...	4-3½x5½-19.6	4	cent...	MeC*.	prs.....	MeC*.	fin.....	sing...	Bosch.	hand..	s&l*...	N-E...	131
H. C.....K	1½	2,200	123	P&B..	p-stl..	s-flex..	sol....	36x3½	36x5	opt...	wd....	own...	4-3½x5½-19.6	4	cent...	MeC*.	prs.....	MeC*.	fin.....	sing...	Bosch.	hand..	s&l*...	N-E...	131
H. C.....G	2	2,600	138	P&B..	p-stl..	s-flex..	sol....	36x4	36x6	opt...	wd....	own...	4-4 x5 -25.6	4	ther...	own...	prs.....	own...	fin.....	sing...	Spltf..	hand..	s&l*...	N-E...	131
H. C.....L	3½	.....	160	P&B..	p-stl..	s-flex..	sol....	36x5	40x10	opt...	wd....	own...	4-4½x5 -29.0	4	ther...	own...	prs.....	own...	fin.....	sing...	Spltf..	hand..	s&l*...	N-E...	.....
ckson.. .. ..C-1920	3½	4,250	150	Cas...	p-stl..	rigid..	sol....	36x7	36x7	Stn...	wd....	Con...	4-4½x5½-32.4	2	cent...	Lng...	cst.....	Lng...	fin.....	sing...	Eismn.	hand..	sl&i-2.	Eismn.	none
arns.....H	¾	1,350	118	Prsh..	p-stl..	rigid..	pnu....	31x4	31x4	E&O..	wd....	Lght..	4-3½x4½-16.9	4	ther...	G&O..	prs.....	G&O..	fin.....	sing...	Berlg..	hand..	sl&i-2.	Dneto.	none
arns.....N	1½	2,000	136	P&B..	p-stl..	rigid..	sol....	34x3½	34x6	E&O..	wd....	H-S..	4-3½x5 -19.6	4	ther...	Bush..	cst.....	Bush..	fin.....	sing...	Berlg..	hand..	s&l-2..	Dneto.	none
aldon.....19	2	2,885	144	own...	rol-c..	flex...	sol....	36x4	36x7	Sth...	mt.....	Buda..	4-4½x5½-29.0	4	cent...	own...	cst.....	Eurk..	cel.....	sing...	Eismn.	hand..	none..	none..	none
elly-Springfield..K-31	1½	3,000	144	own...	p-stl..	flex...	sol....	36x3½	36x6	Crn...	wd....	own...	4-3½x5½-22.5	4	cent...	Fed...	sht.....	Fed...	cel.....	sing...	Eismn.	fixed..	sl&i-2*	West*	.....
elly-Springfield..KS-32	1½	3,000	144	own...	p-stl..	flex...	sol....	36x3½	36x6	Crn...	wd....	own...	4-3½x5½-22.5	4	cent...	Fed...	sht.....	Fed...	cel.....	sing...	Eismn.	fixed..	sl&i-2*	West*	.....
elly-Springfield..K-35	2½	3,500	144	own...	p-stl..	flex...	sol....	36x4	36x4d	Crn...	wd....	own...	4-3½x5½-22.5	4	cent...	Fed...	sht.....	Fed...	cel.....	sing...	Eismn.	fixed..	sl&i-2*	West*	.....
elly-Springfield..KS-36	2½	3,500	144	own...	p-stl..	flex...	sol....	36x4	36x4d	Crn...	wd....	own...	4-3½x5½-22.5	4	cent...	Fed...	sht.....	Fed...	cel.....	sing...	Eismn.	fixed..	sl&i-2*	West*	.....
elly-Springfield..K-40	3½	4,400	150	own...	p-stl..	flex...	sol....	36x5	40x5d	Crn...	wd....	own...	4-4½x6½-32.4	2	cent...	Long..	sht.....	Long..	fin.....	sing...	Eismn.	fixed..	sl&i-2*	West*	.....
elly-Springfield..K-45	4	4,550	150	own...	p-stl..	flex...	sol....	36x5	40x6d	Crn...	wd....	own...	4-4½x6½-32.4	2	cent...	Long..	sht.....	Long..	fin.....	sing...	Eismn.	fixed..	sl&i-2*	West*	.....
elly-Springfield..K-50	5	5,150	150	own...	p-stl..	flex...	sol....	36x6	40x6d	Crn...	wd....	own...	4-4½x6½-32.4	2	cent...	Long..	sht.....	Long..	fin.....	sing...	Eismn.	fixed..	sl&i-2*	West*	.....
elly-Springfield..K-60	6	5,500	150	own...	p-stl..	flex...	sol....	26x6	40x7d	Crn...	wd....	own...	4-4½x6½-32.4	2	cent...	Long..	sht.....	Long..	fin.....	sing...	Eismn.	fixed..	sl&i-2*	West*	.....
ystone.....40	2	2,200	144	own...	rol-c..	s-flex..	p&s...	35x5	36x6	Way..	wd....	own...	4-4½x5½-22.5	2	ther...	MeC..	cst.....	MeC..	fin.....	sing...	Berlg..	hand..	none..	none..	none
mball.....AB	2	3,675	144	Prsh..	p-stl..	flex...	pnu*..	36x5	36x7	Sth...	mt.....	Wsc...	4-4 x6 -25.6	4	cent...	Flx...	prs.....	Flx...	cel.....	sing...	Eismn.	hand..	lghtg..	Splfr..	none
mball.....AC	2½	3,975	159	Prsh..	p-stl..	flex...	pnu*..	36x6	38x7	Sth...	mt.....	Wsc...	4-4½x6 -29.0	4	cent...	Flx...	prs.....	Flx...	cel.....	sing...	Eric...	hand..	lghtg..	Splfr..	none
mball.....AK	3	4,475	159	Prsh..	p-stl..	flex...	sol*...	36x4	36x10	Sth...	mt.....	Wsc...	4-4½x6 -32.4	4	cent...	Flx...	prs.....	Flx...	cel.....	sing...	Eismn.	hand..	lghtg..	Splfr..	none
mball.....AE	4	4,975	170	Prsh..	p-stl..	flex...	sol....	36x5	40x10	Sth...	mt.....	Wsc...	4-4½x6 -36.2	2	cent...	Flx...	prs.....	Flx...	cel.....	sing...	Eismn.	hand..	lghtg..	Splfr..	90
mball.....AF	5	5,975	170	Prsh..	p-stl..	flex...	sol....	36x6	40x12	Sth...	mt.....	Wsc...	4-5 x6 -40.0	2	cent...	Flx...	prs.....	Flx...	cel.....	t-p..	Eric...	hand..	lghtg..	Splfr..	90
ssel.....Delivery	¾	1,875	135	Smh..	p-stl..	flex...	pnu....	34x4½	34x4½	Prud..	wd....	own...	4-3½x5½-24.2	4	cent...	MeC..	sht.....	Fed...	cel.....	sing...	Eismn.	hand..	none..	none..	none
ssel.....Utility	1½	2,275	152	Smh..	p-stl..	flex...	sol....	36x3½	36x5	Prud..	wd....	own...	4-3½x5½-24.2	4	cent...	MeC..	cst.....	MeC..	fin.....	sing...	Eismn.	hand..	none..	none..	none
ssel.....Freighter	2	2,975	168	Smh..	p-stl..	flex...	sol*...	36x4	36x7	Prud..	wd....	own...	4-4½x5½-29.0	4	cent...	MeC..	cst.....	MeC..	fin.....	sing...	Eismn.	hand..	none..	none..	none
ssel.....Heavy Duty	3½	3,975	168	Smh..	p-stl..	flex...	sol*...	36x5	36x5d	Sth...	mt.....	own...	4-4½x5½-29.0	4	cent...	MeC..	cst.....	MeC..	fin.....	sing...	Eismn.	hand..	none..	none..	none
eiber.....AA	1	2,400	130	own...	rol-c..	s-flex..	sol*...	34x3½	34x5	W&L.	wd....	Con...	4-3½x5½-22.5	4	cent...	Pfx...	sht.....	Pfx...	cel.....	sing...	Bosch.	hand..	none..	none..	none
eiber.....A	1½	2,800	143	own...	rol-c..	s-flex..	sol....	36x3½	36x6	W&L.	wd....	Con...	4-4½x5½-27.2	4	cent...	Pfx...	sht.....	Pfx...	cel.....	sing...	Bosch.	hand..	none..	none..	none
eiber.....BB	2	3,200	153	own...	rol-c..	s-flex..	sol....	36x4	36x7	W&L.	wd....	Con...	4-4½x5½-27.2	4	cent...	Pfx...	sht.....	Pfx...	cel.....	sing...	Bosch.	hand..	none..	none..	none
eiber.....B	2½	3,800	160	own...	rol-c..	s-flex..	sol....	36x5	36x8	W&L.	wd....	Con...	4-4½x5 -32.4	2	cent...	own...	cst.....	R-T...	fin.....	sing...	Bosch.	hand..	none..	none..	none
eiber.....C	3½	4,400	163	own...	rol-c..	s-flex..	sol....	36x5	36x10	W&L.	wd....	Con...	4-4½x5 -32.4	2	cent...	own...	cst.....	R-T...	fin.....	sing...	Bosch.	hand..	none..	none..	none
eiber.....D	5	5,300	180	own...	rol-c..	s-flex..	sol....	36x6	40x12	Sth...	mt.....	Con...	4-5½x5½-44.2	2	cent...	own...	cst.....	R-T...	fin.....	sing...	Bosch.	hand..	none..	none..	none
nox.....35-Tractor	....	5,500	108½	own...	rol-c..	s-flex..	sol....	36x5	38x6d	Way..	wd....	own...	4-5 x5½-40.0	2	cent...	Fed...	sht.....	Fed...	cel.....	sing...	Eismn.	hand..	s&l-2..	G&D..	none
oehler.....C	1½	1,885	131	P&B..	p-stl..	s-flex..	sol....	34x3	34x5	Way..	wd....	H-S..	4-3½x5 -19.6	4	ther...	own...	cst.....	Lng...	fin.....	sing...	Eismn.	fixed...	s&l-2..	.....	.....
oehler.....M	2½	3,165	162	P&B..	p-stl..	s-flex..	sol....	36x4	36x7	Way..	wd....	Her...	4-4 x5½-25.6	4	cent...	own...	cst.....	Lng...	fin.....	sing...	Eismn.	fixed..	s&l-2..	.....	.....
nge.....B	2	2,950	136	own...	rol-c..	rigid..	sol....	36x4	36x6	H&D.	wd....	Con...	4-4½x5½-27.2	4	ther...	own...	sht.....	own...	sq-t....	sing...	Bosch.	hand..	none..	none..	none
rrabee.....U	1½	2,250	138	Savg..	p-stl..	flex...	sol....	34x3½	34x5	H&D.	wd....	Con...	4-3½x5 -22.5	4	ther...	own...	cst.....	Bush..	fin.....	sing...	Bosch.	hand..	lghtg..	Eismn.	125
rrabee.....C	2½	3,250	152	Savg..	p-stl..	flex...	sol....	36x4	36x7	H&D.	wd....	Con...	4-4½x5½-27.2	4	cent...	own...	cst.....	Bush..	fin.....	sing...	Bosch.	hand..	lghtg..	Eismn	125
rrabee.....A&B	3½	4,000	154	Savg..	p-stl..	flex...	sol....	36x5	36x5d	H&D.	wd....	Con...	4-4½x5½-32.4	2	cent...	own...	cst.....	Bush..	fin.....	sing...	Bosch.	hand..	lghtg..	Eismn.	125
rrabee.....T	5	4,900	178	Savg..	p-stl..	flex...	sol....	36x6	40x6d	Sth...	mt.....	Con...	4-4½x5 -32.4	2	cent...	own...	cst.....	Bush..	fin.....	s ng...	Bosch.	hand..	none..	none..	none
M. C.....2-20	2½	2,950	164	FAC..	rol-c..	s-flex..	sol....	36x4	36x4d	Bim...	wd....	Con...	4-4½x5½-27.2	4	cent...	Lng...	cst.....	Lng...	fin.....	sing...	Bosch.	hand..	sl&i-2.	Remy.	.....
yal.....	½	950	110	P&B..	p-stl..	flex...	pnu....	32x4	32x5	Bim...	wd....	LeR..	4-3½x4½-15.6	4	ther...	Fed...	prs.....	Fed...	pln.....	dual..	A-Knt	auto..	sl&i-2.	W-L..	none
yal.....Special	¾	1,245	120	P&B..	p-stl..	flex...	pnu....	32x4½	32x4½	Bim...	wd....	H-S..	4-3½x5 -16.9	4	ther...	Fed...	cst.....	Fed...	pln.....	dual..	A-Knt	auto..	sl&i-2.	.....	none
yal.....	1	1,500	130	P&B..	p-stl..	flex...	pnu....	33x5	33x5	Bim...	wd....	H-S..	4-3½x5 -16.9	4	ther...	Fed...	cst.....	Fed...	pln.....	sing...	A-Knt	auto..	sl&i-2.	W-L..	none
accar.....b	1½	2,750	150	Prsh..	p-stl..	rigid..	sol....	36x4	36x5	Sch...	wd....	Con...	4-4½x5½-27.2	4	cent...	own...	cst.....	Bush..	fin.....	sing...	Bosch.	hand..	opt....	opt....	.....
accar.....H	2½	3,500	162	Prsh..	p-stl..	rigid..	sol....	36x4	36x4d	Sch...	wd....	Con...	4-4½x5½-32.4	2	cent...	own...	cst.....	Bus...	fin.....	sing...	Bosch.	hand..	opt....	opt....	.....
accar.....M	3½	4,300	174	Prsh..	p-stl..	rigid..	sol....	36x5	36x5d	Sch...	wd....	Con...	4-4½x5½-32.4	2	cent...	own...	cst.....	Bush..	fin.....	sing...	Bosch.	hand..	opt....	opt....	.....
accar.....G	5	5,250	186	Prsh..	p-stl..	rigid..	sol....	36x5	40x6d	Day..	mt.....	Con...	4-4½x6 -36.2	2	cent...	own...	cst.....	Bush..	fin.....	sing...	Bosch.	hand..	opt....	opt....	.....
ack.....AB	1½	3,000	144	own...	p-stl..	flex...	sol....	36x4	36x3½d	Sch...	wd....	own...	4-4 x5 -25.6	2	cent...	own...	sht.....	own...	cel.....	sing...	Splfr..	hand..	lhtg-2*	L-N...	175*
ack.....AB	1½	3,000	144	own...	p-stl..	flex...	sol....	36x4	36x3½d	Sch...	wd....	own...	4-4 x5 -25.6	2	cent...	own...	sht.....	own...	cel.....	sing...	Spltf..	hand..	lhtg-2*	L-N...	175*

ABBREVIATIONS—Types of Construction

*—other options
amid—amidship
auto—automatic
bevl—bevel
cel—cellular
cent—centrifugal
chn—chain
cst—cast
ctr—center
cylinders cast, 2 in pairs
cylinders cast, 4 in block
cylinders cast, 3 in threes
cylinders cast, 1 singly
cyl-ends—cylinder-ends
d—dual
d-d—dry-disk
d-p—dry-plate
dipix—from both motor & driveshaft
d-rd—double reduction
d-s—drive-shaft
elec—electric
ext-d-s—external drive-shaft
ext-f-w—external front wheel
ext-g—external gear
ext-jst—external jack-shaft
ext-r-w—external rear wheel
fab—fabric
fin—finned tube
flex—flexible
fric—friction
g-p—gear pump
grv—gravity
gset—from gearset
hyd—hydraulic
ind-c—individual clutch
int-g—internal gear
int-g-4—internal gear drive on 4 wheels
int-r-w—internal rear wheel
jst—unit with jackshaft
l—left
l-b—loose ball
lghtg—lighting only
motr—unit with motor
mt—metal (wheels)
mtl—metal (universal joint)
opt—optional
pist—piston pump
plan—planetary
pln—plain tube
pnu—pneumatic
pres—pressure
prog—progressive
prs—pressed steel
p&s—pneumatics in front, solids in rear
p-stl—pressed steel
r—right
r&c—right & center
r-rd—radius rods
rol-c—rolled channel
rol-i—rolled I-beam
selec—selective
s-flex—semi-flexible
sht—sheet
s&l—starting & lighting
sl&i-2—starting, lighting & ignition, 2 unit
sol—solid
sprgs—springs
sq-t—square-tube
start—starting only
t-arm—torque arm
ther—thermo-syphon
t-p—two-point
t-t—torsion tube
vac—vacuum
wat-tube—water tube
wd—wood
w-d—multiple disk in oil
w-p—plate in oil
wr—wire
zz-t—zig-zag tube

ABBREVIATIONS—Makers of Parts

*Other Options
Acme—Acme Universal Joint Mfg. Co.
A-Knt—Atwater-Kent
Al-Ch—Allis-Chalmers
Aloy—Alloy Steel Spring
Amer—American Magneto Co.
Arch—Archibald
Arvac—Arvac Co.
Aut-L—Auto-Lite
Auto—Auto-Wheel Co.
A-W-W—Automotive Wire Wheel Co.
B&B—Ball & Ball
B-Beck—Borg & Beck
Berlg—Berling
Bet—Betts Spring Co.
Bim—Bimel
B-Lipe—Brown-Lipe
Blood—Blood Bros.
Brem—Bremer
Bvr—Beaver Mfg. Co.
B&W—B & W Mfg. Co.
Can—Candler Radiator
Cant—Canton-Cleveland
Carl—Carleton Co.
Cart—Carter Carburetor
Cas—G. M. Castle
CAS—C. A. S. Products
Chgo—Chicago Mfg. Co.
Chic—Chicago-Standard
Chmp—Champion Auto Spring Co.
Chy—Cheney
Clrk—Clark Equipment
Col—Columbia Axle Co.
Con—Continental Motor
Conn—Connecticut
Crn—Crane & Mac-Mahon Co.
C-S—Christopher Simpson Iron Co.
Day—Dayton
Del—Delaney
Detlaf—Detlaff

Gasoline Motor Trucks for 1920—Cont.

ENGINE									TRANSMISSION										BRAKES		CONTROL			UNIVERSALS		
GOVERNOR			SPEED		FUEL SYS.		CLUTCH		GEARSET				FINAL DRIVE								STEERING GEAR					
Type	Make	Drive	Motor in r.p.m.	Truck in m.p.h.	Carbureter Make	Fuel Feed	Type	Make	Type	Make	Placed	Speeds	Type	Rear Axle Make	Total Gear Reduction	Propulsion Taken By	Torque Taken By	Springs Make	Foot	Hand	Placed	Make	Levers	Type	Make	Name and Model
none.	none..	none..	.....	.....	Stmbg.	vac..	d-d..	Fuller..	selec..	Fuller..	motr..	3	int-g..	Russl.	.....	sprgs..	sprgs..	GCS.	ext-r-w..	int-r-w	l....	Lavn..	ctr..	mtl..	Blood..	Independent (Iowa)...E
none.	none..	none..	.....	.....	.....	vac..	d-d..	Fuller..	selec..	Fuller..	motr..	3	int-g..	Russl.	.....	sprgs..	sprgs..	GCS.	ext-r-w..	int-r-w	l....	Lavn..	ctr..	mtl..	Blood..	Independent (Iowa)...F
suct..	Mnrch.	motor	.....	.....	Zenith.	grv..	d-d..	Fuller..	selec..	Fuller..	motr..	3	worm.	Chic..	7.75	sprgs..	sprgs..	Iron..	int-r-w	int-r-w	l....	.....	ctr..	mtl..	Sterl..	Independent (Ohio)...F
suct..	Mnrch.	motor	.....	.....	Zenith.	grv..	d-d..	Fuller..	selec..	Fuller..	motr..	3	worm.	Wis....	9.66	sprgs..	sprgs..	Iron..	int-r-w	int-r-w	l....	Wol...	ctr..	mtl..	Sterl..	Independent (Ohio)...G
cent.	Wau...	motor	1300	17	Stmbg.	grv..	d-p..	B-Beck.	selec..	Covert.	amid..	3	worm.	Shel...	7.80	r-rd...	sprgs..	Shel..	int-r-w	int-r-w	l....	Wol...	ctr..	mtl..	Acme..	Indiana.....2
cent.	Pierce..	motor	1150	16	Stmbg.	grv..	d-p..	B-Beck.	selec..	B-Lipe.	amid..	4	worm.	Shel...	7.75	r-rd...	sprgs..	Shel..	int-r-w	int-r-w	l....	Wol...	ctr..	mtl..	Acme..	Indiana.....20
cent.	Pierce..	motor	1160	15	Stmbg.	grv..	d-p..	B-Beck.	selec..	B-Lipe.	amid..	4	worm.	Shel...	7.75	r-rd...	sprgs..	Shel..	int-r-w	int-r-w	l....	Wol...	ctr..	mtl..	Acme..	Indiana.....25
cent.	Pierce..	motor	1150	12	Stmbg.	grv..	d-p..	B-Beck.	selec..	B-Lipe.	amid..	4	worm.	Shel...	10.25	r-rd...	sprgs..	Shel..	int-r-w	int-r-w	l....	Wol...	ctr..	mtl..	Spicer..	Indiana.....35
cent.	Wau...	motor	800	11	Stmbg.	grv..	d-p..	B-Beck.	selec..	B-Lipe.	amid..	4	worm.	Shel...	8.75	r-rd...	sprgs..	Shel..	int-r-w	int-r-w	l....	Wol...	ctr..	mtl..	Spicer..	Indiana.....50
.....	.....	.....	.....	.....	Schblr..	.....	.....	.....	selec..	Detrt..	motr..	3	int-g..	Torbn.	.....	.....	.....	.....	ext-r-w..	int-r-w	.....	.....	.....	.....	.....	Inland.....C
.....	.....	.....	.....	.....	Zenith.	.....	d-p..	.....	.....	Fuller..	motr..	..	int-g..	Torbn.	.....	.....	.....	Mth..	.....	.....	.....	Lavn..	.....	.....	.....	Inland.....D
cent.	own...	motor	1275	17	Ens...	grv..	d-d..	own...	selec..	own...	amid..	3	int-g..	own...	7.91	sprgs..	sprgs..	Stand.	int-r-w..	int-r-w	l....	own...	ctr..	mtl..	own...	I. H. C.....F
cent.	own...	motor	1275	15	Ens...	grv..	d-d..	own...	selec..	B-Lipe.	amid..	4	int-g..	own...	8.96	sprgs..	sprgs..	Stand.	int-r-w..	int-r-w	l....	own...	ctr..	mtl..	own...	I. H. C.....K
cent.	own...	motor	1100	13	Ens...	grv..	d-d..	own...	selec..	B-Lipe.	amid.	4	int-g..	own...	8.96	sprgs..	sprgs..	Stand.	int-r-w..	int-r-w	l....	own...	ctr..	mtl..	own...	I. H. C.....G
cent.	own...	motor	1100	12	Ens...	grv..	d-d..	own...	selec..	B-Lipe.	amid..	4	int-g..	own...	10.98	sprgs..	sprgs..	Stand.	int-r-w..	int-r-w	l....	own...	ctr..	mtl..	own...	I. H. C.....L
cent.	Pierce..	motor	1000	12	Stmbg.	vac..	d-p..	B-Beck.	selec..	own...	amid..	4	bevl-4	own...	9.18	sprgs..	sprgs..	S-P...	int-r-w..	ext-d-s	r....	Ross..	r....	mtl..	Spicer..	Jackson.....C-1920
suct..	Mnrch.	motor	1000	25	Zenith.	grv..	d-p..	B-Beck.	selec.	G-Lees.	motr..	3	int-g..	Torbn.	6.00	sprgs..	sprgs..	Mth..	int-r-w..	ext-r-w	l*	Lavn..	ctr..	mtl..	Peters.	Kearns.....H
suct..	Mnrch.	motor	.....	20	Zenith.	grv..	d-p..	B-Beck.	selec..	G-Lees.	motr..	3	int-g..	Torbn.	8.00	sprgs..	sprgs..	Mth..	int-r-w..	int-r-w	l*	Lavn..	ctr..	mtl..	Peters.	Kearns.....N
cent.	Pierce..	motor	1200	17	Stmbg.	grv..	d-d..	Fuller..	selec..	Fuller..	motr..	4	int-g..	Russl..	7.40	sprgs..	sprgs..	Chmp	ext-r-w..	int-r-w	l....	Ross..	ctr..	mtl..	Univl..	Keldon.....19
cent.	Pierce..	motor	1400	17	Zenith.	grv..	cone..	own...	selec..	Covert.	amid..	3	chn...	own...	8.66	r-rd...	t-t....	S-P...	int-r-w	int-r-w	l....	Gem..	l&c.	mtl..	own...	Kelly-Springfield..K-31
cent.	Pierce..	motor	1400	17	Zenith.	grv..	cone.	own...	selec..	Covert.	amid..	3	worm.	Shel...	8.66	r-rd...	t-t....	S-P...	int-r-w	int-r-w	l....	Gem..	l&c.	mtl..	Spicer..	Kelly-Springfield..KS-32
cent.	Pierce..	motor	1400	14	Zenith.	grv..	cone.	own...	selec..	Covert.	amid..	3	chn...	own...	10.64	r-rd...	t-t....	S-P...	int-r-w	int-r-w	l....	Gem..	l&c.	mtl..	own...	Kelly-Springfield..K-35
cent.	Pierce..	motor	1400	14	Zenith.	grv..	cone.	own...	selec..	Covert.	amid..	3	worm.	Shel...	10.33	r-rd...	t-t....	S-P...	int-r-w	int-r-w	l....	Gem..	l&c.	mtl..	Spicer..	Kelly-Springfield..KS-36
cent.	Pierce..	motor	1400	16	Rayfld.	grv..	cone.	own...	selec..	Covert.	amid..	3	chn...	own...	10.48	r-rd...	t-t....	S-P...	int-r-w	int-r-w	l....	Gem..	l&c.	mtl..	own...	Kelly-Springfield..K-40
cent.	Pierce..	motor	1400	16	Rayfld.	grv..	cone.	own...	selec..	Covert.	amid..	3	chn...	own...	10.71	r-rd...	t-t....	S-P...	int-r-w	int-r-w	l....	Gem..	ctr..	mtl..	own...	Kelly-Springfield..K-45
cent.	Pierce..	motor	1400	13	Rayfld.	grv..	cone.	own...	selec..	Covert.	amid..	3	chn...	own...	12.24	r-rd...	t-t....	S-P...	int-r-w	int-r-w	l....	Gem..	l&c.	mtl..	own...	Kelly-Springfield..K-50
cent.	Pierce..	motor	1400	13	Rayfld	grv..	cone.	own...	selec..	Covert.	amid..	3	chn...	own...	12.39	r-rd...	t-t....	S-P...	int-r-w	int-r-w	l....	Gem..	l&c.	mtl..	own...	Kelly-Springfield..K-60
cent.	Pierce..	motor	1350	17	Zenith.	grv..	d-d..	Fuller..	selec..	Fuller..	motr..	3	int-g..	Russl..	8.90	sprgs..	sprgs..	Rowl..	ext-r-w..	int-r-w	l....	Ditdw	ctr..	mtl..	Spicer..	Keystone.....40
cent.	Dplx...	dplx..	1600	18	Zenith.	vac..	d-d..	B-Lipe.	selec..	B-Lipe.	amid..	4	worm.	Shel...	6.50	sprgs..	sprgs..	U.S..	int-r-w..	int-d-s.	l....	Ross..	ctr..	mtl..	Spicer..	Kimball.....AB
cent.	Dplx...	dplx..	1600	17	Zenith.	vac..	d-d..	B-Lipe.	selec..	B-Lipe.	amid..	4	worm.	Shel...	7.75	sprgs..	sprgs..	U.S..	int-r-w	ext-d-s	l....	Ross..	ctr..	mtl..	Spicer..	Kimball.....AC
cent.	Dplx...	dplx..	1250	16	Zenith.	vac..	d-d..	B-Lipe.	selec..	B-Lipe.	amid.	4	worm.	Shel...	7.75	sprgs..	sprgs..	U.S..	int-r-w	ext-d-s	l....	Ross..	ctr..	mtl..	Spicer..	Kimball.....AK
cent.	Dplx...	dplx..	1400	14	Zenith.	vac..	d-d..	Fuller..	selec..	Fuller..	amid.	4	worm.	Shel...	8.75	sprgs..	sprgs..	U.S..	int-r-w	int-r-w	l....	Ross..	ctr..	mtl..	Spicer..	Kimball.....AE
cent.	Dplx...	dplx..	1400	12	Zenith.	vac..	d-d..	Fuller..	selec..	Fuller..	amid.	4	worm.	Shel...	8.75	sprgs..	sprgs..	U.S..	int-r-w	int-r-w	l....	Ross..	ctr..	mtl..	Spicer..	Kimball.....AF
cent.	Pierce..	motor	1200	25	Stmbg.	vac..	d-d..	Warn..	selec..	Warn..	motr..	3	bevel..	own...	5.00	sprgs..	sprgs..	Mth..	ext-r-w..	ext-r-w	l....	Jacox.	ctr..	mtl..	Spicer..	Kissel.....Delivery
cent.	Pierce..	motor	1150	17	Stmbg.	vac..	d-d..	Warn..	selec..	Warn..	motr..	3	worm.	Shel...	7.80	sprgs..	sprgs..	Dtr...	int-r-w..	int-r-w	l....	Jacox.	ctr..	mtl..	Spicer..	Kissel.....Utility
cent.	Pierce..	motor	1190	15	Stmbg.	vac..	d-d..	Warn..	selec..	Warn..	amid.	4	worm.	Timkn.	8.50	sprgs..	sprgs..	Mth..	int-r-w..	int-r-w	l....	Lavn..	ctr..	mtl..	Spicer..	Kissel.....Freighter
cent.	Pierce..	motor	1315	12	Stmbg.	vac..	d-d..	Warn..	selec..	Warn..	amid..	4	worm.	Shel...	11.75	sprgs..	sprgs..	Shel..	int-r-w..	int-r-w	l....	Ross..	ctr..	mtl..	Spicer..	Kissel.....Heavy Duty
cent.	Pierce..	motor	1200	20	Stmbg.	grv..	d-d..	B-Lipe.	selec..	B-Lipe.	motr..	3	worm.	Timkn.	7.00	sprgs..	sprgs..	Bet...	int-r-w..	int-r-w	r....	Ross..	ctr..	mtl..	Spicer..	Kleiber.....AA
cent.	Pierce..	motor	1200	18	Stmbg.	grv..	w-d..	M&E..	selec..	B-Lipe.	amid.	4	worm.	Shel...	7.75	sprgs..	sprgs..	Bet...	int-r-w..	int-r-w	r....	Ross..	ctr..	mtl..	Spicer..	Kleiber.....A
cent.	Pierce..	motor	1200	18	Stmbg.	grv..	w-d..	M&E..	selec..	B-Lipe.	amid.	4	worm.	Timkn.	7.75	sprgs..	sprgs..	Bet...	int-r-w..	int-r-w	r....	Ross..	ctr..	mtl..	Spicer..	Kleiber.....BB
cent.	Pierce..	motor	1200	18	Stmbg.	grv..	w-d..	M&E..	selec..	B-Lipe.	amid.	4	worm.	Shel...	7.75	sprgs..	sprgs..	Bet...	int-r-w..	int-r-w	r....	Ross..	ctr..	mtl..	Spicer..	Kleiber.....B
cent.	Pierce..	motor	1200	17	Stmbg.	grv..	w-d..	M&E..	selec..	B-Lipe.	amid.	4	worm.	Timkn.	8.75	sprgs..	sprgs..	Bet...	int-r-w..	int-r-w	r....	Ross..	ctr..	mtl..	Spicer..	Kleiber.....C
cent.	Pierce..	motor	1200	15	Stmbg.	grv..	w-d..	M&E..	selec..	B-Lipe.	amid.	4	worm.	Timkn.	11.66	r-rd...	sprgs..	Bet...	int-r-w..	int-r-w	r....	Ross..	ctr..	mtl..	Spicer.	Kleiber.....D
none.	none...	none..	1000	9	Zenith.	vac..	d-p..	own...	selec..	own...	jst....	2	chn...	own...	.....	r-rd...	.....	.....	ext-jst..	int-r-w	l....	Ross..	ctr..	mtl..	own...	Knox.....35-Tractor
cent.	Dplx...	motor	1250	18	Zenith.	grv..	d-d..	Mech..	selec..	Mech..	motr..	3	int-g..	Torbn..	7.00	sprgs..	sprgs..	Mth..	ext-r-w..	int-r-w	l....	own...	ctr..	mtl..	Spicer.	Koehler.....C
cent.	Dplx...	motor	1225	14	Zenith.	grv..	d-d..	B-Lipe.	selec..	B-Lipe.	amid..	4	worm.	Timkn.	9.30	sprgs..	sprgs..	Mth..	int-r-w..	int-r-w	l....	Lavn..	ctr..	mtl*	Spicer*	Koehler.....M
cent.	Pierce..	motor	1250	15	Stmbg.	vac..	w-d..	M&E..	ind-c....	own...	amid..	3	chn...	own...	9.00	r-rd...	.....	Stand.	ext-r-w..	int-r-w	l....	Gem..	ctr..	mtl..	M&E..	Lange.....B
cent.	Duplex.	motor	1225	16	Schblr..	grv..	d-d..	B-Lipe.	selec..	B-Lipe.	motr..	3	worm.	Shel...	7.8	sprgs..	sprgs..	Merl..	int-r-w..	int-r-w	l....	Ross..	ctr..	mtl..	Unvsl.	Larrabee.....U
cent.	Duplex.	motor	1200	15	Schblr..	grv..	d-d..	B-Lipe.	selec..	B-Lipe.	amid..	4	worm.	Shel...	8.75	sprgs..	sprgs..	Merl..	int-r-w..	int-r-w	l....	Ross..	ctr..	mtl..	Unvsl.	Larrabee.....C
cent.	Duplex.	motor	1000	12	Schblr..	grv..	d-d..	B-Lipe.	selec..	B-Lipe.	amid..	4	worm.	Shel...	8.75	sprgs..	sprgs..	Merl..	int-r-w..	int-r-w	l....	Ross..	ctr..	mtl..	Unvsl.	Larrabee.....A&B
cent.	Duplex.	motor	1000	10	Schblr..	grv..	d-d..	B-Lipe.	selec..	B-Lipe.	amid..	4	worm.	Shel...	11.75	sprgs..	sprgs..	Merl..	int-r-w..	int-r-w	l....	Ross..	ctr..	mtl..	Unvsl.	Larrabee.....T
cent.	Pierce..	motor	1150	14	Stmbg.	vac..	d-p..	B-Beck.	selec..	Detrt..	amid..	4	int-g..	Russl..	8.80	sprgs..	sprgs..	Mth..	ext-r-w..	int-r-w	l....	Lavn..	ctr..	fab*.	Therm*	L. M. C.....2-20
.....	.....	.....	1000	30	Stmbg.	grv..	d-p..	B-Beck.	selec..	Covert.	motr..	3	int-g..	Torbn..	.....	sprgs..	sprgs..	.....	int-r-w..	ext-r-w	l....	Ross..	ctr..	mtl..	Blood..	Loyal.....
.....	.....	.....	1000	30	Stmbg.	grv..	d-d..	B-Beck.	selec..	Covert.	motr..	3	int-g..	Torbn..	.....	sprgs..	sprgs..	.....	ext-r-w..	int-r-w	l....	Ross..	ctr..	mtl..	Blood..	Loyal.....Special
.....	.....	.....	1000	20	Stmbg.	grv..	d-p..	B-Beck.	selec..	Covert.	motr..	3	int-g..	Torbn..	.....	sprgs..	sprgs..	.....	int-r-w..	int-r-w	l....	Ross..	ctr..	mtl..	Blood..	Loyal.....
cent.	Pierce..	motor	1200	18	Stmbg.	grv..	d-d..	B-Lipe.	selec..	B-Lipe.	motr..	3	worm.	Timkn..	7.00	r-rd...	sprgs..	Merl..	int-r-w..	int-r-w	l....	Ross..	ctr..	mtl..	Spicer..	Maccar.....L
cent.	Pierce..	motor	1200	16	Stmbg.	grv..	d-d..	B-Lipe.	selec..	B-Lipe.	motr..	3	worm.	Timkn.	7.75	r-rd...	sprgs..	Merl..	int-r-w..	int-r-w	l....	Ross..	ctr..	mtl..	Spicer..	Maccar.....H
cent.	Pierce..	motor	1200	15	Stmbg.	grv..	d-d..	B-Lipe.	selec..	B-Lipe.	motr..	3	worm.	Timkn.	8.75	r-rd...	sprgs..	Merl..	int-r-w..	int-r-w	l....	Ross..	ctr..	mtl..	Spicer..	Maccar.....M
cent.	Con...	motor	1050	12	Zenith.	grv..	d-d..	B-Lipe.	selec..	B-Lipe.	amid..	4	worm.	Timkn.	10.25	r-rd...	sprgs..	Merl..	int-r-w..	int-r-w	l....	Ross..	ctr..	mtl..	Spicer..	Maccar.....G
cent.	own...	motor	1250	16	Zenith.	grv..	d-d..	B-Lipe.	selec..	B-Lipe.	motr..	4	worm.	Timkn.	8.50	sprgs..	sprgs..	Merl..	int-r-w..	int-r-w	l....	own...	ctr..	mtl..	Spicer..	Mack.....AB
cent.	own...	motor	1250	20	Zenith.	grv..	d-d..	B-Lipe.	selec..	B-Lipe.	motr..	4	chn...	own...	6.99	r-rd...	.....	Merl..	ext-d-s..	int-r-w	l....	own...	ctr..	mtl..	Blood..	Mack.....AB

ABBREVIATIONS—Makers of Parts—(Continued)—

Detrt—Detroit G. & M.
Ditw—Ditwiler Mfg. Co.
Dneto—Dyneto
Drt—Detroit Pressed Steel Co.
Dtr—Detroit Products
Dtrt—Detroit Lubricator
Dun—Dunbar Mfg. Co.
Dur—Durston Gear Corp.
E&M—English & Mersick
E&O—Eberly & Orris
Eismn—Eisemann
Ens—Ensign Carburetor
Eric—Ericsson Mfg. Co.
Eurk—Eureka
F&H—French & Hecht
FAC—F. A. Chapper
Fed—Fedders
Flx—Flexo Mfg. Co.
Frank—Francke Co.
G&D—Gray & Davis
G&O—G & O Mfg. Co.
GCS—Garden City Springs
Gem—Gemmer
G-Lees—Grant-Lees
Grn—Greens Car Wheel
H&D—Hoopes Bros. & Darlington
Har—Harrison
Hart—Hartford
Harv—Harvey
Hay—Hayes Wheel Co.
Her—Hercules
Hig—Higgins
Hink—Hinkley
Hol—Holley
H-Shaw—Hele-Shaw
H-S—Herschell-Spillman
Hyd—Hydraulic
Idl—Ideal
Ind—Indestructible
Iron—Iron City
Jacox—Jackson-Church-Wilcox
Jck—Jackson Auto
Jns—Phineas Jones & Co.
John—Johnson Co.
Kal—Kalamazoo
Kel—Kelsey Wheel Co.
Ken—Kenosha Wheel &
Knz—Kuntz
Lavn—Lavine
LeR—Le Roi
Lght—Light Mfg. Co.
L-N—Leece-Neville Co.
Lng—Long
Lvgn—Livingston
Lyc—Lycoming
Marvl—Marvel
Mas—F. C. Mason & Co.
Mast—Master
McCn—McCanna
M&E—Merchant & Evans
McC—McCord
Mech—Mechanics Mach. Co.
Merl—Merrill Spring Co.
Miller—H. A. Miller
Mnrch—Monarch
Mod—Modine Mfg. Co.
Mot—Mott Wheel Wks.
M-R—Marlin-Rockwell
MSC—Massillon
Mth—Mather
Mut—Mutual Wheel Co.
Nat—National Spring
Natl—National Can Co.
N-E—North East
Nich—Nichols Elec. Co.
P&B—Parish & Bingham
Perk—Perkins
Pet—Peters Mach. Co.
Pfx—Perfex Radiator
Phil—Philadelphia
Phro—Pharo Mfg. Co.
Prsh—Parish Mfg. Co.
Prud—Prudden
Rayfld—Rayfield
Rem—Remy
Rowl—Wm. H. Rowland
Roy—Royer Wheel Co.
R-T—Rome-Turney
Rugl—Ruggles
Rus—Russel Car & Frdy.
Russl—Russel Axle Co.
Rut—Rutenber
R&V—Root & VanDervoort
Sag—Saginaw
Sal—Salisbury
Savg—Savage Arms
Sch—Schwarz Wheel Co.
Schblr—Schebler
Shel—Sheldon
Simp—Simplex
S-J—Shotwell-Johnson
S-M—Standard Malle-
Smh—A. O. Smith
Sth—Smith Steel Wheel
S-P—Standard Parts Co.
Splf—Splitdorf
Sp-P—Spring Perch Co.
Stan—Standard Radiator
Stand—Standard Steel Spring Co.
Sterl—Sterling Bearings
Stmbg—Stromberg
Stn—Standard Wheel Co.
S-W—Sparks-Withington
Sum—Sumter Elec. Co.
Therm—Thermoid
Timkn—Timken
Torbn—Torbensen
Tuth—Tuthill
Univl—Universal Prdts.
Unv—Universal
Unvsl—Universal Mach.
U. S.—U. S. Spring Co.
Wag—Wagner
Warn—Warner
Wau—Waukesha
West—Westinghouse
Wil-B—Wilcox Bennett
Wis—Wisconsin Parts
W-L—Ward-Leonard
W&L—Waterhouse & Lester Co.
Way—Wayne Wheel Co.
Wol—Wohlrab
Wsc—Wisconsin
Yng—Youngstown Pressed Steel Co.

Detailed Technical Specifications of

Name and Model	Tons Capacity	Chassis Price	Wheelbase, Inches	FRAME			TIRES			WHEELS		ENGINE				COOLING					IGNITION			ELEC. SYSTEM		
								Size in Ins.								Radiator										
				Make	Material	Type	Kind	Front	Rear	Make	Type	Make	No. Cyl. Bore and Stroke—N.A.C.C. Hp.	Cylinders Cast	Water Circ.	CASE Make	CASE Type	CORE Make	CORE Type	Type	Make	Spark Advance	Type	Make	Extra Cost $
Mack AB	2	$3,300	120	own	p-stl	flex	sol	36x4	36x4d	Sch	wd	own	4-4 x5 -25.6	2	cent	own	sht	own	cel	sing	Spltf	hand	lhtg-2*	L-N	175*
Mack AB	2	3,300	120	own	p-stl	flex	sol	36x4	36x4d	Sch	wd	own	4-4 x5 -25.6	2	cent	own	sht	own	cel	sing	Spltf	hand	lhtg-2*	L-N	175*
Mack AC	3½	4,950	opt	own	p-stl	flex	sol	36x5	40x5d	Sch	wd	own	4-5 x6 -40.0	2	cent	own	cst	own	pln	dual	Spltf	hand	lhtg-2*	L-N	175*
Mack Tractor AB	5	3,400	120	own	p-stl	flex	sol	36x4	36x4d	Sch	wd	own	4-4 x5 -25.6	2	cent	own	sht	own	cel	sing	Spltf	hand	lhtg 2*	L-N	175*
Mack AC	5½	5,500	opt	own	p-stl	flex	sol	36x6	40x6d	Sch	wd	own	4-5 x6 -40.0	2	cent	own	cst	own	pln	dual	Spltf	hand	lhtg-2*	L-N	175*
Mack Tractor AC	7	4,950	119	own	p-stl	flex	sol	36x5	40x5d	Sch	wd	own	4-5 x6 -40.0	2	cent	own	cst	own	pln	dual	Spltf	hand	lhtg-2*	L-N	175*
Mack AC	7½	6,000	opt	own	p-stl	flex	sol	36x7	40x7d	Sch	wd	own	4-5 x6 -40.0	2	cent	own	cst	own	pln	dual	Spltf	hand	lhtg-2*	L-N	175*
Mack Tractor AC	11	5,500	119	own	p-stl	flex	sol	36x6	40x6d	Sch	wd	own	4-5 x6 -40.0	2	cent	own	cst	own	cel	dual	Spltf	hand	lhtg-2*	L-N	175*
Mack Tractor AC	15	6,000	119	own	p-stl	flex	sol	36x7	40x7d	Sch	wd	own	4-5 x6 -40.0	2	cent	own	cst	own	pln	dual	Spltf	hand	lhtg-2*	L-N	175*
Master JW	1½	2,290	142	P&B	p-stl	s-flex	sol	34x3½	34x5	Prud	wd	Buda	4-4½x5½-27.2	4	cent	own	cst	Chgo	fin	sing	Eismn	fixed	s&l*	West	150
Master JI	1½	2,190	142	P&B	p-stl	s-flex	sol	34x3½	34x5	Prud	wd	Buda	4-4½x5½-27.2	4	cent	own	cst	Chgo	fin	sing	Eismn	fixed	s&l*	West	150
Master M	2	2,590	144	P&B	p-stl	s-flex	sol	34x4	36x7	Prud	wd	Buda	4-4½x5½-29.0	4	cent	own	cst	Chgo	fin	sing	Eismn	fixed	s&l*	West	150
Master W	2	2,890	144	P&B	p-stl	s-flex	sol	34x4	36x7	Prud	wd	Buda	4-4½x5½-29.0	4	cent	own	cst	Chgo	fin	sing	Eismn	fixed	s&l*	West	150
Master A	3½	3,990	158	P&B	p-stl	s-flex	sol	36x5	40x5d	Sth	mt	Buda	4-4½x6½-32.4	4	cent	own	cst	Chgo	fin	sing	Eismn	auto	s&l*	West	150
Master B	5	4,990	170	P&B	p-stl	s-flex	sol	36x6	40x6d	Sth	mt	Buda	4-5 x6 -36.2	4	cent	own	cst	Chgo	fin	sing	Eismn	auto	lghtg*	West	150*
Master Tractor T	6	2,850	110	P&B	p-stl	s-flex	sol	34x4	36x4d	Prud	wd	Buda	4-4½x5½-29.0	4	cent	own	cst	Chgo	fin	sing	Eismn	fixed	lghtg*	West	150*
Maxwell 1½	1½	1,185	124	Prsh	p-stl	s-flex	sol*	32x3	32x4	Kel	wd	own	4-3½x4½-21.1	4	ther	own	prs	own	fin	sing	A-Knt	hand	lghtg	Aut-L	none
Moreland 19N	1	2,600	126	Smh	p-stl	rigid	pnu	35x5	35x5	Drt	mt	Buda	4-3½x5½-22.5	4	cent	own	cst	Mod	cel	sing	Spltf	hand	lghtg	West	.....
Moreland 19B	1½	2,930	126	Smh	p-stl	rigid	sol	36x3½	36x5	Sth	mt	Con	4-4½x5½-27.2	4	cent	own	cst	Mod	cel	sing	Spltf	hand	lghtg	West	.....
Moreland 19C	2½	3,775	144	Smh	p-stl	rigid	sol	36x4	36x7	Sth	mt	Con	4-4½x5½-32.4	2	cent	own	cst	Mod	cel	sing	Spltf	hand	lghtg	West	.....
Moreland 19G	4	4,875	162	Smh	p-stl	rigid	sol	36x5	40x5d	Sth	mt	Con	4-4½x6 -36.2	2	cent	own	cst	Mod	cel	sing	Spltf	hand	lghtg	West	.....
Moreland 19V	5	5,350	192	Smh	p-stl	rigid	sol	36x6	40x6d	Sth	mt	Con	4-4½x6 -36.2	2	cent	own	cst	Mod	cel	sing	Spltf	hand	lghtg	West	.....
Muskegon 20	2	2,325	144	P&B	p-stl	flex	sol	36x4	36x6	Prud	wd	Con	4-4½x5½-27.2	2	cent	own	cst	M-R	cel	sing	Eismn	fixed	none	none	none
Mutual 2A	2	3,375	150	P&B	p-stl	s-flex	sol*	36x4	36x8	Sth*	mt*	Wsc	4-4 x6 -25.6	4	cent	Pfx	cst	Pfx	cel	sing	Bosch	hand	s&l	West	none
Mutual 2½AP	2½	.....	153	P&B	p-stl	s-flex	pnu	38x7	42x9	Day*	mt	Wsc	4-4 x6 -25.6	.....	.....	Pfx	.....	Pfx	cel	sing	Bosch	hand	s&l	West	none
Mutual 3½A	3½	.....	.....	P&B	p-stl	s-flex	sol	36x5	40x10	Sth*	mt	Wsc	4-4½x6 -32.4	4	.....	Pfx	.....	Pfx	cel	sing	Bosch	hand	s&l	West	none
Mutual 5A	5	.....	.....	P&B	p-stl	s-flex	sol	36x6	40x12	Sth*	mt	Wsc	4-5 x6 -40.0	4	.....	Pfx	.....	Pfx	cel	sing	Bosch	hand	s&l	West	none
Napoleon 9	1	1,385	132	own	rol-c	rigid	sol*	32x3½	34x4	Roy	wd	Gray	4-3½x5 -19.6	4	ther	Chgo	cst	Chgo	fin	sing	Aut-L	hand	lghtg	Aut-L	none
Napoleon 11	1½	1,660	132	own	rol-c	rigid	sol*	32x4	34x5	Roy	wd	Gray	4-3½x5 -19.6	4	ther	Chgo	cst	Chgo	fin	sing	Aut-L	hand	lghtg	Aut-L	none
Nash 2018	1	1,650	130	Smh	p-stl	rigid	sol*	34x3	34x4	own	wd	own	4-3½x5½-22.5	4	cent	McC	cst	McC	fin	sing	Eismn	hand	s&l-2	Aut-L	none
Nash 3018	1½	2,250	144	Smh	p-stl	rigid	sol*	34x4	36x6	own	wd	own	4-3½x5½-22.5	4	cent	McC	cst	McC	fin	sing	Eismn	hand	s&l-2	Aut-L	none
Nash 4017	2	3,250	124	Smh	p-stl	rigid	sol*	36x5	36x5	own	mt	Buda	4-4½x5½-29.0	4	cent	McC	cst	McC	fin	sing	Eismn	hand	none	none	none
Nelson & LeMoon F1½	1½	.....	opt	own	rol-c	s-flex	sol*	36x3½	36x5	Prud	wd	Con	4-4½x5½-27.2	4	cent	own	cst	Chgo	fin	sing	Bosch	hand	s&l-2*	West	175
Nelson & LeMoon F2	2	.....	opt	own	rol-c	s-flex	sol	36x4	36x7	Prud	wd	Con	4-4½x5½-27.2	4	cent	own	cst	Chgo	fin	sing	Bosch	hand	s&l-2*	West	175
Nelson & LeMoon F3½	3½	.....	opt	own	rol-c	s-flex	sol	36x5	36x5d	Prud	wd	Con	4-4½x5½-32.4	2	cent	own	cst	Chgo	fin	sing	Bosch	hand	s&l-2*	West	175
Nelson & LeMoon FC5	5	.....	opt	own	rol-c	s-flex	sol	36x6	40x6d	Prud	wd	Con	4-4½x6 -36.2	2	cent	own	cst	Chgo	fin	dual	Bosch	hand	s&l-2*	West	175
Netco D	2	3,200	144	P&B	p-stl	flex	sol*	36x4	36x7	Arch	wd	Con	4-4½x5½-27.2	4	cent	own	cst	R-T	fin	sing	Eismn	fixed	none	none	none
Netco H	2½	3,400	168	P&B	p-stl	s-flex	sol*	36x4	36x8	Arch	wd	Con	4-4½x5½-32.4	2	cent	own	cst	R-T	fin	sing	Eismn	fixed	none	none	none
Niles E	2	2,800	140	Savg	p-stl	flex	sol	36x4	36x7	H&D	wd	Con	4-4½x5½-27.2	4	cent	Fed	sht	Fed	cel	sing	Eismn	hand	none	none	none
Noble A20	1	.....	144	P&B	p-stl	s-flex	sol*	36x3½	36x4	Bim	wd	Buda	4-3½x5½-22.5	4	cent	Chgo	cst	Chgo	fin	sing	Eismn	hand	s&l-2	Eismn	.....
Noble B30	1½	.....	144	P&B	p-stl	s-flex	sol*	36x3½	36x5	Bim	wd	Buda	4-3½x5½-22.5	4	cent	Chgo	cst	Chgo	fin	sing	Eismn	hand	s&l-2	Eismn	.....
Noble C40	2	.....	148	P&B	p-stl	s-flex	sol*	36x4	36x7	Bim	wd	Buda	4-4 x5½-25.6	4	cent	Chgo	cst	Chgo	fin	sing	Eismn	hand	s&l-2	Eismn	.....
Noble D50	2½	.....	162	P&B	p-stl	s-flex	sol*	36x4	36x8	Bim	wd	Buda	4-4½x5½-29.0	4	cent	Chgo	cst	Chgo	fin	sing	Eismn	hand	lghtg	Eismn	.....
Noble E70	3½	.....	182	P&B	p-stl	s-flex	sol	36x5	36x10	Bim	wd	Buda	4-4½x6 -32.4	4	cent	Chgo	cst	Chgo	fin	sing	Eismn	hand	lghtg	Eismn	.....
Northway B-2	2	3,250	146	Drt	p-stl	s-flex	sol	36x4	36x4d	Clrk	mt	own	4-4 x6 -25.6	4	cent	G&O	cst	G&O	cel	sing	Wag	hand	sl&i-2	West	none
Northway B-3½	3½	4,250	160	Drt	p-stl	s-flex	sol	36x5	40x5d	Clrk	mt	own	4-4 x6 -25.6	4	cent	G&O	cst	G&O	cel	sing	Wag	hand	sl&i-2	West	none
Old Hickory W	1	2,175	135	own	rol-c	s-flex	sol*	36x3½	36x4	Stn	wd	Con	4-3½x5 -22.5	4	ther	own	cst	Lng	fin	sing	Eismn	hand	none	none	none
Old Reliable A	1½	2,350	138	Savg	p-stl	flex	sol	34x4	36x6	Prud	wd	Wsc	4-4 x5 -25.6	4	cent	Chgo	sht	Chgo	fin	sing	Bosch	hand	lghtg	Vesta	50*
Old Reliable B	2½	3,250	160	own	rol-c	rigid	sol	34x4	36x4d	Crn	wd	Wsc	4-4½x6 -29.0	4	cent	Chgo	cst	Chgo	fin	sing	Bosch	hand	lghtg	Vesta	50*
Old Reliable C	3½	4,000	160	own	rol-c	rigid	sol	36x5	36x5d	Crn	wd	Wsc	4-4½x6 -29.0	4	cent	Chgo	cst	Chgo	fin	sing	Bosch	hand	lghtg	Vesta	50*
Old Reliable D	5	5,000	166	own	rol-c	rigid	sol	36x6	40x6d	Crn	wd	Wsc	4-5 1/16x5½-41.6	2	cent	Chgo	cst	Chgo	fin	sing	Bosch	hand	lghtg	Vesta	50*
Old Reliable K	7½	6,000	136	own	rol-c	rigid	sol	36x6	40x7d	Crn*	wd*	Wau	4-4½x6½-36.2	2	cent	Chgo	cst	Chgo	fin	sing	Bosch	hand	none	none	none
Packard 1½-E	1½	3,200	144	own	rol-c	s-flex	sol	34x3½	34x3½d	own	wd	own	4-4 x5½-25.6	4	cent	Fed	cst	Fed	fin	dual	Spltf	hand	s&l-2	Bijur	230
Packard 2-E	2	3,600	144	own	rol-c	s-flex	sol	34x4	34x4d	own	wd	own	4-4 x5½-25.6	4	cent	Fed	cst	Fed	fin	dual	Spltf	hand	s&l-2	Bijur	230
Packard 3-E	3	4,350	156	own	rol-c	s-flex	sol	36x5	36x5d	own	wd	own	4-4½x5½-32.4	4	cent	Fed	cst	Fed	fin	dual	Spltf	hand	s&l-2	Bijur	230

ABBREVIATIONS—Types of Construction

*—other options
amid—amidship
auto—automatic
bevl—bevel
cel—cellular
cent—centrifugal
chn—chain
cst—cast
ctr—center
cylinders cast, 2 in pairs
cylinders cast, 4 in block
cylinders cast, 3 in threes
cylinders cast, 1 singly
cyl-ends—cylinder-ends
d—dual
d-d—dry-disk
d-p—dry-plate
dplx—from both motor & driveshaft
d-rd—double reduction
d-s—drive-shaft
elec—electric
ext-d-s—external drive-shaft
ext-f-w—external front wheel
ext-g—external gear
ext-jst—external jack-shaft
ext-r-w—external rear wheel
fab—fabric
fin—finned tube
flex—flexible
fric—friction
g-p—gear pump
grv—gravity
gset—from gearset
hyd—hydraulic
ind-c—individual clutch
int-g—internal gear
int-g-f—internal gear drive on 4 wheels
int-r-w—internal rear wheel
jst—unit with jackshaft
l—left
l-b—loose ball
lghtg—lighting only
motr—unit with motor
mt—metal (wheels)
mtl—metal (universal joint)
opt—optional
pist—piston pump
plan—planetary
pln—plain tube
pnu—pneumatic
pres—pressure
prog—progressive
prs—pressed steel
p&s—pneumatics in front, solids in rear
p-stl—pressed steel
r—right
r&c—right & center
r-rd—radius rods
rol-c—rolled channel
rol-i—rolled I-beam
selec—selective
s-flex—semi-flexible
sht—sheet
s&l—starting & lighting
sl&i-2—starting, lighting & ignition, 2 unit
sol—solid
sprgs—springs
sq-t—square-tube
start—starting only
t-arm—torque arm
ther—thermo-syphon
t-p—two-point
t-t—torsion tube
vac—vacuum
wat-tube—water tube
wd—wood
w-d—multiple disk in oil
w-p—plate in oil
wr—wire
zz-t—zig-zag tube

ABBREVIATIONS—Makers of Parts

*Other Options
Acme—Acme Universal Joint Mfg. Co.
A-Knt—Atwater-Kent
Al-Ch—Allis-Chalmers
Aloy—Alloy Steel Spring
Amer—American Magneto Co.
Arch—Archibald
Arvac—Arvac Co.
Aut-L—Auto-Lite
Auto—Auto-Wheel Co.
A-W-W—Automotive Wire Wheel Co.
B&B—Ball & Ball
B-Beck—Borg & Beck
Berlg—Berling
Bet—Betts Spring Co.
Bim—Bimel
B-Lipe—Brown-Lipe
Blood—Blood Bros.
Brem—Bremer
Bvr—Beaver Mfg. Co.
B&W—B & W Mfg. Co.
Can—Candler Radiator
Cant—Canton-Cleveland
Carl—Carleton Co.
Cart—Carter Carburetor
Cas—G. M. Castle
CAS—C. A. S. Products
Chgo—Chicago Mfg. Co.
Chic—Chicago-Standard
Chmp—Champion Auto Spring Co.
Chy—Cheney
Clrk—Clark Equipment
Col—Columbia Axle Co.
Con—Continental Motor
Conn—Connecticut
Crn—Crane & Mac-Mahon Co.
C-S—Christopher Simpson Iron Co.
Day—Dayton
Del—Delaney
Detlaf—Detlaff

Gasoline Motor Trucks for 1920—Cont.

ENGINE											TRANSMISSION												BRAKES		CONTROL			UNIVERSALS			
GOVERNOR			SPEED		FUEL SYS.		CLUTCH		GEARSET				FINAL DRIVE												STEERING GEAR						
Type	Make	Drive	Motor in r.p.m.	Truck in m.p.h.	Carbureter Make	Fuel Feed	Type	Make	Type	Make	Placed	Speeds	Type	Rear Axle Make	Total Gear Reduction	Propulsion Taken By	Torque Taken By	Springs Make	Foot	Hand	Placed	Make	Levers	Type	Make	Name and Model						
cent.	own...	motor	1250	19	Zenith.	grv...	d-d...	B-Lipe.	selec...	B-Lipe.	motr..	4	chn...	own....	6.99	r-rd...	.....	Merl..	ext-d-s..	int-r-w..	l...	own...	ctr..	mtl..	Blood..	Mack	AB					
cent.	own...	motor	1250	16	Zenith.	grv...	d-d...	B-Lipe.	selec...	B-Lipe.	motr..	4	worm.	Timkn.	8.50	sprgs..	sprgs..	Merl..	int-r-w..	int-r-w..	l...	own...	ctr..	mtl..	Spicer..	Mack	AB					
cent.	own...	motor	1000	14	Zenith.	grv...	d-p...	own...	selec...	own...	jst...	3	chn...	own...	8.49	r-rd...	.....	Merl..	ext-jst..	int-r-w..	l...	own...	ctr..	mtl..	Spicer..	Mack	AC					
cent.	own...	motor	1250	13	Zenith.	grv...	d-d...	B-Lipe.	selec...	B-Lipe.	motr..	4	chn...	own...	10.53	r-rd...	.....	Merl..	ext-d-s..	int-r-w..	l...	own...	ctr..	mtl..	Blood..	Mack	Tractor AB					
cent.	own...	motor	1000	13	Zenith.	grv...	d-p...	own...	selec...	own...	jst...	3	chn...	own...	9.00	r-rd...	.....	Merl..	ext-jst..	int-r-w..	l...	own...	ctr..	mtl..	Spicer..	Mack	AC					
cent.	own...	motor	1000	11	Zenith.	grv...	d-p...	own...	selec...	own...	jst...	3	chn...	own...	10.76	r-rd...	.....	Merl..	ext-jst..	int-r-w..	l...	own...	ctr..	mtl..	Spicer..	Mack	Tractor AC					
cent.	own...	motor	1000	10	Zenith.	grv...	d-p...	own...	selec...	own...	jst...	3	chn...	own...	11.58	r-rd...	.....	Merl..	ext-jst..	int-r-w..	l...	own...	ctr..	mtl..	Spicer..	Mack	AC					
cent.	own...	motor	1000	10	Zenith.	grv...	d-p...	own...	selec...	own...	jst...	3	chn...	own...	11.58	r-rd...	.....	Merl..	ext-jst..	int-r-w..	l...	own...	ctr..	mtl..	Spicer..	Mack	Tractor AC					
cent.	own...	motor	1000	8	Zenith.	grv...	d-p...	own...	selec...	own...	jst...	3	chn...	own...	14.10	r-rd...	.....	Merl..	ext-jst..	int-r-w..	l...	own...	ctr..	mtl..	Spicer..	Mack	Tractor AC					
suct..	McCn..	motor	1200	15	Mast...	grv...	d-d...	Fuller..	selec...	Fuller..	motr..	3	worm.	Timkn.	7.75	sprgs..	sprgs..	Detr..	ext-r-w..	int-r-w..	l...	Ross.	ctr..	mtl..	Arvac..	Master	JW					
suct..	McCn..	motor	1200	15	Mast...	grv...	d-d...	Fuller..	selec...	Fuller..	motr..	3	int-g..	Torbn..	8.00	sprgs..	sprgs..	Detr..	ext-r-w..	int-r-w..	l...	Ross.	ctr..	mtl..	Arvac..	Master	JI					
suct..	McCn	motor	1200	16	Mast..	grv*	d-d...	B-Lipe.	selec...	B-Lipe.	motr..	4	int-g..	Timkn.	8.00	sprgs..	sprgs..	Detr..	ext-r-w..	int-r-w..	l...	Ross.	ctr..	mtl..	Arvac..	Master	M					
suct..	McCn..	motor	1200	15	Mast..	grv*	d-d...	B-Lipe.	selec...	B-Lipe.	motr..	4	worm.	Timkn.	8.50	sprgs..	sprgs..	Detr..	ext-r-w..	int-r-w..	l...	Ross.	ctr..	mtl..	Arvac..	Master	W					
cent.	Pierce..	motor	1100	12	Mast..	grv*	d-d...	B-Lipe.	selec...	B-Lipe.	amid..	4	worm.	Timkn.	10.33	sprgs..	sprgs..	Detr..	int-r-w..	int-r-w..	l...	Ross.	ctr..	mtl..	Spicer*	Master	A					
cent.	Pierce..	motor	1000	10	Mast..	grv*	d-d...	B-Lipe.	selec...	B-Lipe.	amid..	4	worm.	Timkn.	10.25	sprgs..	sprgs..	Detr..	int-r-w..	int-r-w..	l...	Ross.	ctr..	mtl..	Spicer.	Master	B					
suct..	McCn..	motor	1200	15	Mast..	grv*	d-d...	B-Lipe*	selec...	B-Lipe*	motr..	4	int-g..	Torbn..	8.00	sprgs..	sprgs..	Detr..	int-r-w..	int-r-w..	l...	Ross.	ctr..	mtl..	Arvac..	Master Tractor	T					
none.	none.	.....	1562	22	John...	grv...	cone..	own...	selec...	own...	motr..	3	worm.	own....	7.25	sprgs..	sprgs..	Detr..	int-r-w..	int-r-w..	l...	own...	ctr..	mtl..	own...	Maxwell	1½					
none.	none...	none..	1150	20	Miller..	grv...	d-d...	own...	selec...	own...	amid..	4	worm.	Timkn.	6.20	r-rd...	sprgs..	U.S..	int-r-w..	int-r-w..	l...	Gem..	ctr..	fab..	own....	Moreland	19N					
none.	none...	none..	1150	18	Miller..	grv...	d-d...	own...	selec...	own...	amid..	4	worm.	Timkn.	7.09	r-rd...	sprgs..	U.S..	int-r-w..	int-r-w..	l...	Ross.	ctr..	fab..	own...	Moreland	19B					
none.	none...	none..	1100	17	Miller..	grv...	d-d...	own...	selec...	own...	amid..	4	worm.	Timkn.	6.80	r-rd...	sprgs..	U.S..	int-r-w..	int-r-w..	l...	Ross.	ctr..	fab..	own...	Moreland	19C					
cent.	Con...	motor	1050	16	Miller..	grv...	d-d...	own...	selec...	own...	amid..	4	worm.	Timkn.	7.80	r-rd...	sprgs..	U.S..	int-r-w..	int-r-w..	l...	Ross.	ctr..	fab..	own...	Moreland	19G					
cent.	Con...	motor	1050	13	Miller..	grv...	d-d...	own...	selec...	own...	amid..	4	worm.	Timkn.	10.25	r-rd...	sprgs..	.....	int-r-w..	int-r-w..	l...	Ross.	ctr..	fab..	own...	Moreland	19V					
cent.	Pierce..	gset...	1260	15	Detrt..	vac...	d-d...	Fuller..	selec...	Fuller..	motr..	3	int-g..	Torbn..	1.00	sprgs..	sprgs..	Cant..	ext-r-w..	int-r-w..	l...	Lavn..	ctr..	mtl..	Arvac*	Muskegon	20					
cent.	Dplx...	Dplx..	1000	14	Stmbg.	grv...	w-d...	H-S*...	selec...	Fuller..	amid..	4	worm.	Shel....	1.00	r-rd...	sprgs..	Mth..	int-r-w..	int-r-w..	l...	Ross.	ctr..	mtl..	Spicer..	Mutual	2A					
cent.	Dplx...	Dplx..	1200	20	Stmbg.	grv...	w-d...	H-S....	.....	.....	amid..	4	worm.	Shel....	.....	r-rd...	r-rd...	Mth..	int-r-w..	int-r-w..	l...	Ross.	ctr..	mtl..	Spicer..	Mutual	2½AP					
cent.	Dplx...	Dplx..	.....	.....	Stmbg.	grv...	w-d...	H-S....	.....	.....	amid..	4	worm.	Shel....	.....	r-rd...	r-rd...	Mth..	int-r-w..	int-r-w..	l...	Ross.	ctr..	mtl..	Spicer..	Mutual	3½A					
cent.	Dplx...	Dplx..	.....	.....	Stmbg.	grv...	.....	H-S....	.....	.....	amid..	4	worm.	Shel....	.....	r-rd...	r-rd...	Mth..	int-r-w..	int-r-w..	l...	Ross.	ctr..	mtl..	Spicer..	Mutual	5A					
cent.	Pierce..	motor	1400	12	Stmbg.	grv...	d-d...	Fuller..	selec...	Fuller..	motr..	3	int-g..	Clrk...	6.00	sprgs..	sprgs..	Mth..	ext-r-w..	ext-d-s..	l...	Lavn..	ctr..	mtl..	Unvsl..	Napoleon	9					
cent.	Pierce..	motor	1400	12	Stmbg.	grv...	d-d...	Fuller..	selec...	Fuller..	motr..	3	int-g..	Clrk...	8.00	sprgs..	sprgs..	Mth..	ext-r-w..	ext-d-s..	l...	Lavn..	ctr..	mtl..	Unvsl..	Napoleon	11					
cent.	Simp...	motor	1351	20	Stmbg.	grv...	d-p...	B-Beck.	selec...	Detrt..	motr..	3	int-g..	Clrk...	6.83	sprgs..	sprgs..	Aloy..	ext-r-w..	ext-d-s..	l...	Jacox.	ctr..	mtl..	own...	Nash	2018					
cent.	Simp...	motor	1400	15	Stmbg.	grv...	d-p...	B-Beck.	selec...	Detrt..	amid..	4	int-g..	Clrk...	8.00	sprgs..	sprgs..	Mth..	ext-r-w..	ext-d-s..	l...	Jacox.	ctr..	mtl..	own...	Nash	3018					
cent.	Simp...	motor	1270	16	Stmbg.	grv...	d-p...	B-Beck.	selec...	own...	amid..	4	int-g-4	own....	8.05	sprgs..	sprgs..	Mth..	ext-r-w..	ext-d-s..	l...	Lavn..	ctr..	mtl..	own...	Nash	4017					
cent.	Pierce..	motor	1200	16	Stmbg.	grv...	d-d...	B-Lipe.	selec...	B-Lipe.	motr..	3	worm.	Timkn.	6.75	sprgs..	sprgs..	Tuth..	int-r-w..	int-r-w..	r...	Lavn..	ctr..	fab..	own...	Nelson & LeMoon.	F1½					
cent.	Pierce..	motor	1200	16	Stmbg.	grv...	d-d...	B-Lipe.	selec...	B-Lipe.	motr..	3	worm.	Timkn.	7.00	sprgs..	sprgs..	Tuth..	int-r-w..	int-r-w..	r...	Lavn..	ctr..	fab..	own...	Nelson & LeMoon.	F2					
cent.	Pierce..	motor	1100	12	Stmbg.	grv...	d-d...	B-Lipe.	selec...	B-Lipe.	motr..	4	worm.	Timkn.	8.75	sprgs..	sprgs..	Tuth..	int-r-w..	int-r-w..	r...	Lavn..	ctr..	fab..	own...	Nelson & LeMoon.	F3½					
cent.	Pierce..	motor	1100	10	Stmbg.	grv...	d-d...	B-Lipe.	selec...	B-Lipe.	amid..	4	worm.	Timkn.	10.33	sprgs..	sprgs..	Tuth..	int-r-w..	int-r-w..	r...	Lavn..	ctr..	fab..	own...	Nelson & LeMoon.	FC5					
none.	none...	none..	1500	24	Zenith.	grv...	d-d...	B-Lipe.	selec...	B-Lipe.	motr..	3	worm.	Timkn.	1.00	sprgs..	sprgs..	S-P...	int-r-w..	int-r-w..	l...	Ross.	ctr..	mtl..	Hart...	Netco	D					
none.	none...	none..	1500	24	Zenith.	grv...	d-d...	B-Lipe.	selec...	B-Lipe.	amid..	4	worm.	Timkn.	1.00	sprgs..	sprgs..	S-P...	int-r-w..	int-r-w..	l...	Ross.	ctr..	mtl..	Hart...	Netco	H					
cent.	Pierce..	motor	2500	25	Stmbg.	grv...	d-d...	B-Beck.	selec...	Covert.	amid..	3	worm.	Timkn.	8.50	r-rd...	sprgs..	Iron..	int-r-w..	int-r-w..	l...	Gem..	ctr..	mtl..	Blood..	Niles	E					
cent.	Pierce..	motor	1468	20	Stmbg.	grv...	d-d...	Fuller.	selec...	Fuller..	motr..	3	worm.	Shel....	7.80	sprgs..	sprgs..	Tuth..	int-r-w..	int-r-w..	l...	Lavn..	ctr..	mtl..	M&E..	Noble	A20					
cent	Pierce..	motor	1290	18	Stmbg.	grv...	d-d...	Fuller.	selec...	Fuller..	motr..	3	worm.	Shel....	7.75	sprgs..	sprgs..	Tuth..	int-r-w..	int-r-w..	l...	Lavn..	ctr..	mtl..	M&E..	Noble	B30					
cent.	Pierce..	motor	1075	15	Stmbg.	grv...	d-d...	Fuller.	selec...	Fuller..	motr..	3	worm.	Shel....	7.75	sprgs..	sprgs..	Tuth..	int-r-w..	int-r-w..	l...	Lavn..	ctr..	mtl..	M&E..	Noble	C40					
cent.	Pierce..	motor	1215	15	Stmbg*	grv...	d-d...	Fuller.	selec...	Fuller..	amid..	4	worm.	Shel....	7.75	sprgs..	sprgs..	Tuth..	int-r-w..	int-r-w..	l...	Lavn..	ctr..	mtl..	M&E..	Noble	D50					
cent.	Pierce..	motor	972	12	Stmbg*	grv*..	d-d...	Fuller.	selec...	Fuller..	amid..	4	worm.	Shel....	8.75	sprgs..	sprgs..	Tuth..	int-r-w..	int-r-w..	l...	Lavn..	ctr..	mtl..	M&E..	Noble	E70					
cent.	Pierce..	motor	1300	18	Schblr..	vac...	d-d...	Fuller.	selec...	Fuller..	motr..	4	worm.	Shel....	7.75	sprgs..	sprgs..	S-P...	int-r-w..	int-r-w..	l...	Ross.	ctr..	mtl..	Spicer..	Northway	B-2					
cent.	Pierce..	motor	1350	14	Schblr..	vac...	d-d...	Fuller.	selec...	Fuller..	motr..	4	worm.	Shel....	10.25	sprgs..	sprgs..	S-P...	int-r-w..	int-r-w..	l...	Ross.	ctr..	mtl..	Spicer..	Northway	B-3½					
cent.	Pierce..	motor	1200	18	Stmbg.	vac...	d-p...	B-Beck.	selec...	G-Lees.	motr..	3	worm.	Timkn.	1.00	sprgs..	sprgs..	S-P...	int-r-w..	int-r-w..	l...	Lavn..	ctr..	mtl..	Blood..	Old Hickory	W					
none.	none...	none..	1135	15	Stmbg.	vac...	d-d...	B-Lipe.	selec...	B-Lipe.	motr..	3	worm.	Shel....	7.75	sprgs..	sprgs..	Shel...	int-r-w..	int-r-w..	r...	Ross..	ctr..	mtl..	Spicer..	Old Reliable	A					
suct..	Mnrch.	motor	1135	15	Stmbg.	vac...	d-d...	Fuller..	selec...	Fuller..	amid..	4	worm.	Shel....	7.75	sprgs..	sprgs..	Shel...	int-r-w..	int-r-w..	r...	Ross..	ctr..	mtl..	Spicer..	Old Reliable	B					
suct..	Mnrch.	motor	1280	15	Stmbg.	vac...	d-d...	Fuller..	selec...	Fuller..	amid..	4	worm.	Shel....	8.75	sprgs..	sprgs..	Shel...	int-r-w..	int-r-w..	r...	Ross..	ctr..	mtl..	Spicer..	Old Reliable	C					
suct..	Mnrch.	motor	1155	15	Stmbg.	vac...	w-d...	Unv....	selec...	Savg...	amid..	4	worm.	Shel....	8.75	sprgs..	sprgs..	Shel...	int-r-w..	int-r-w..	r...	Ross..	r...	mtl..	Spicer..	Old Reliable	D					
cent.	Wau...	motor	955	10	Stmbg.	grv...	w-d...	Unv....	selec...	Savg...	jst....	4	chn...	Shel....	10.86	r-rd...	.....	Shel...	ext-d-s..	int-r-w..	r...	Ross..	r...	mtl..	Hart...	Old Reliable	K					
cent.	own...	motor	1000	16	own...	pres..	d-d...	own...	selec...	own...	amid..	4	worm.	own....	6.25	r-rd...	t-arm.	Sp-P..	ext-d-s..	int-r-w..	l...	own...	l&c.	mtl*	Spicer*	Packard	1½-E					
cent.	own...	motor	1000	14	own...	pres...	d-d...	own...	selec...	own...	amid..	4	worm.	own....	7.25	r-rd...	t-arm.	Sp-P..	ext-d-s..	int-r-w..	l...	own...	l&c.	mtl*.	Spicer*	Packard	2-E					
cent.	own...	motor	1000	12	own...	pres...	d-d...	own...	selec...	own...	amid..	4	worm.	own....	9.00	r-rd...	t-arm.	Sp-P..	ext-d-s..	int-r-w..	l...	own...	l&c.	mtl*.	Spicer*	Packard	3-E					

ABBREVIATIONS—Makers of Parts—(Continued)—

Detrt—Detroit G. & M.
Ditw—Ditwiler Mfg. Co.
Dneto—Dyneto
Drt—Detroit Pressed Steel Co.
Dtr—Detroit Products
Dtrt—Detroit Lubricator
Dun—Dunbar Mfg. Co.
Dur—Durston Gear Corp.
E&M—English & Merrick
E&O—Eberly & Orris
Eismn—Eisemann
Ens—Ensign Carburetor
Eric—Ericsson Mfg. Co.
Eurk—Eureka
F&H—French & Hecht
FAC—F. A. Chapper
Fed—Fedders
Flx—Flexo Mfg. Co.
Frank—Francke Co.
G&D—Gray & Davis
G&O—G & O Mfg. Co.
GCS—Garden City Springs
Gem—Gemmer
G-Lees—Grant-Lees
Grn—Greens Car Wheel
H&D—Hoopes Bros. & Darlington
Har—Harrison
Hart—Hartford
Harv—Harvey
Hay—Hayes Wheel Co.
Her—Hercules
Hig—Higgins
Hink—Hinkley
Hol—Holley
H-Shaw—Hele-Shaw
H-S—Herschell-Spillman
Hyd—Hydraulic
Idl—Ideal
Ind—Indestructible
Iron—Iron City
Jacox—Jackson-Church-Wilcox
Jck—Jackson Auto
Jns—Phineas Jones & Co.
John—Johnson Co.
Kal—Kalamazoo
Kel—Kelsey Wheel Co.
Ken—Kenosha Wheel & Mfg.
Knz—Kuntz
Lavn—Lavine
LeR—Le Roi
Lght—Light Mfg. Co.
L-N—Leece-Neville Co.
Lng—Long
Lvgn—Livingston
Lyc—Lycoming
Marvl—Marvel
Mas—F. C. Mason & Co.
Mast—Master
McCn—McCanna
M&E—Merchant & Evans
McC—McCord
Mech—Mechanics Mach. Co.
Merl—Merrill Spring Co.
Miller—H. A. Miller
Mnrch—Monarch
Mod—Modine Mfg. Co.
Mot—Mott Wheel Wks.
M-R—Marlin-Rockwell
MSC—Massillon
Mth—Mather
Mut—Mutual Wheel Co.
Nat—National Spring
Natl—National Can Co.
N-E—North East
Nich—Nichols Elec. Co.
P&B—Parish & Bingham
Perk—Perkins
Pet—Peters Mach. Co.
Pfx—Perfex Radiator
Phil—Philadelphia
Phro—Pharo Mfg. Co.
Prsh—Parish Mfg. Co.
Prud—Prudden
Rayfld—Rayfield
Rem—Remy
Rowl—Wm. H. Rowland
Roy—Royer Wheel Co.
R-T—Rome-Turney
Rugl—Ruggles
Rus—Russel Car & Frdy.
Russl—Russel Axle Co.
Rut—Rutenber
R&V—Root & VanDervoort
Sag—Saginaw
Sal—Salisbury
Savg—Savage Arms
Sch—Schwarz Wheel Co.
Schblr—Schebler
Shel—Sheldon
Simp—Simplex
S-J—Shotwell-Johnson
S-M—Standard Malleable
Smh—A. O. Smith
Sth—Smith Steel Wheel
S-P—Standard Parts Co.
Spltf—Splitdorf
Sp-P—Spring Perch Co.
Stan—Standard Radiator
Stand—Standard Steel Spring Co.
Sterl—Sterling Bearings
Stmbg—Stromberg
Stn—Standard Wheel Co.
S-W—Sparks-Withington
Sum—Sumter Elec. Co.
Therm—Thermoid
Timkn—Timken
Torbn—Torbensen
Tuth—Tuthill
Univl—Universal Prdts.
Unv—Universal
Unvsl—Universal Mach.
U. S.—U. S. Spring Co.
Wag—Wagner
Warn—Warner
Wau—Waukesha
West—Westinghouse
Wil-B—Wilcox Bennett
Wis—Wisconsin Parts
W-L—Ward-Leonard
W&L—Waterhouse & Lester Co.
Way—Wayne Wheel Co.
Wol—Wohlrab
Wsc—Wisconsin
Yng—Youngstown Pressed Steel Co.

Detailed Technical Specifications of

Name and Model	Tons Capacity	Chassis Price	Wheelbase, Inches	FRAME Make	FRAME Material	FRAME Type	TIRES Kind	TIRES Size in Ins. Front	TIRES Size in Ins. Rear	WHEELS Make	WHEELS Type	ENGINE Make	ENGINE No. Cyl. Bore and Stroke—N.A.C.C. Hp.	ENGINE Cylinders Cast	COOLING Water Circ.	COOLING Radiator CASE Make	COOLING Radiator CASE Type	COOLING Radiator CORE Make	COOLING Radiator CORE Type	IGNITION Type	IGNITION Make	IGNITION Spark Advance	ELEC. SYSTEM Type	ELEC. SYSTEM Make	ELEC. SYSTEM Extra Cost $
Packard	4-E	4	$4,550	156	own...	rol-c..	s-flex..	sol....	36x5	40x5d	own...	wd...	own...	4-4½x5½-32.4	4	cent...	Fed...	cst.....	Fed...	fin.....	dual..	Splf..	hand..	s&l-2..	Bijur.	230
Packard	S-E	5	5,400	156	own..	rol-c..	s-flex..	sol	36x6	40x6d	own...	wd...	own...	4-5 x5½-40.0	4	cent...	Fed...	cst.....	Fed...	fin.....	dual..	Splf..	hand..	s&l-2..	Bijur..	230
Packard	6-E	6	5,700	156	own...	rol-c..	s-flex..	sol....	36x6	40x7d	own...	wd...	own...	4-5 x5½-40.0	4	cent...	Fed...	cst.....	Fed...	fin.....	dual..	Splf..	hand..	s&l-2..	Bijur..	230
Paige	5-7-18	2½	3,150	150	own...	p-stl..	s-flex..	sol*...	36x4	36x4d	Day..	mt....	Con...	4-4½x5½-27.2	4	cent...	Natl..	cst.....	Natl..	fin.....	sing..	Bosch.	fixed..	none..	none..	none
Paige	51-18	3½	4,150	160	own...	p-stl..	s-flex..	sol*...	36x5	36x5d*	Day..	mt....	Con...	4-4½x5½-32.4	4	cent...	Natl..	cst.....	Natl..	fin.....	sing..	Bosch.	hand..	none..	none..	none
Parker	F9 W	2	3,500	150	Smh..	p-stl..	s-flex..	sol....	34x4	36x4d	Bim...	wd....	Con...	6-3½x5½-29.5	4	cent...	own...	cst.....	Brem..	zz-t....	sing..	Bosch.	hand..	s&l-2..	West..	none
Parker	J9	3½	4,400	160	Smh..	p-stl..	s-flex..	sol....	36x5	40x5d	Bim...	wd....	Wsc...	4-4½x6 -324.	4	cent...	own...	cst.....	Brem..	zz-t....	sing..	Bosch.	hand..	s&l-2..	West..	none
Parker	M9	5	5,500	160	Smh..	p-stl..	s-flex..	sol....	36x6	40x6d	Sth....	mt....	Con...	4-4½x6 -36.2	2	cent...	own...	cst.....	Brem..	zz-t....	sing..	Bosch.	hand..	s&l-2..	West..	none
Pierce-Arrow	X4	2	4,300	150	Prsh..	p-stl..	flex....	sol*...	36x4	36x4d	own...	wd....	own...	4-4 x5½-25.6	2	cent...	own...	cst.....	own...	fin.....	dual..	Splf..	hand..	s&l-2..	West..	300
Pierce-Arrow	R9	5	5,500	168	Prsh..	p-stl..	flex....	sol....	36x5	40x6d	own...	wd....	own...	4-4½x6 -38.2	2	cent...	own...	cst.....	own...	fin.....	sing..	Splf..	hand..	s&l-2..	West..	300
Pioneer All Steel	F	2	2,790	144	Prsh..	p-stl..	.....	sol....	36x4	36x7	Budd..	mt....	Con...	4-4½x5½-27.2	4	cent...	McC..	cst.....	McC..	fin.....	dual..	Eismn.	auto..	none..	none..	none
Pony		¼	320	90	own...	rol-c..	rigid..	pnu....	28x3	28x3	Prud..	wd....	own...	4-2½x4 -12.1	4	ther...	own...	prs.....	own...	cel.....	sing..	A-Knt	auto..	opt....	opt....	.....
Power	B	2	2,950	150	own...	rol-c..	s-flex..	sol....	36x4	36x4d	Hay..	wd....	Con...	4-4½x5½-27.2	4	cent...	Can...	cst.....	Can...	cel.....	sing..	Simms	hand..	none..	none..	none
Rainier	R-11	¾	1,750	125	Prsh..	p-stl..	s-flex..	pnu....	34x4½	34x4½	Sch...	wd....	Con...	4-3½x5 -19.6	4	ther...	Har...	sht.....	Har...	cel.....	sing..	Bosch*	fixed..	opt....	Bosch*	125*
Rainier	R-9	1	1,875	125	Prsh..	p-stl..	s-flex..	sol....	32x3	32x4	Sch...	wd....	Con...	4-3½x5 -19.6	4	ther...	Har...	prs.....	Har...	cel.....	sing..	Simms	fixed..	opt....	Bosch*	125*
Rainier	R-6	1½	1,975	133	Prsh..	p-stl..	s-flex..	sol....	34x3	34x4	Sch...	wd....	Con...	4-3½x5 -19.6	4	ther...	Har...	prs.....	Har...	cel.....	sing..	Bosch*	fixed..	opt....	Bosch*	125*
Rainier	R-8	2	2,400	147	Prsh..	p-stl..	s-flex..	sol....	34x5	34x6	Sch...	wd....	Con...	4-3½x5 -22.5	4	ther...	Har...	prs.....	Har...	cel	sing..	Simms	fixed..	none..	none..	none
Reo	F	¾	1,285	128	own...	p-stl..	rigid..	pnu....	34x4½	34x4½	Prud*.	wd....	own...	4-4½x4½-27.2	2	cent...	own...	prs.....	own...	fin.....	sing..	Rem..	hand..	s&l-2.	Rem..	none
Republic	10	1	1,595	124	Drt*..	p-stl..	s-flex..	sol*...	34x3	34x4	Prud*.	wd....	Con...	4-3½x5 -22.5	4	ther...	own...	cst.....	G&O..	cel.....	sing..	Eismn.	fixed..	s&l-2..	Aut-L.	.....
Republic	11	1½	1,885	144	Drt*..	p-stl..	s-flex..	sol*...	34x3½	34x5	Prud*.	wd....	Con...	4-3½x5 -22.5	4	ther...	own...	cst.....	G&O..	cel.....	sing..	Eismn	fixed..	s&l-2..	Aut-L.	.....
Republic	19	2½	2,395	144	Drt*..	p-stl..	s-flex..	sol*...	36x4	36x7	Prud*.	wd....	Con...	4-4½x5½-27.2	4	cent...	own...	cst.....	G&O..	cel.....	sing..	Eismn.	hand..	s&l-2..	Aut-L.	.....
Republic	20	3½	3,595	165	Drt*..	p-stl..	s-flex..	sol*...	36x5	36x10	Sth...	mt....	Con...	4-4½x5½-32.4	2	cent...	own...	cst.....	G&O..	fin.....	sing..	Eismn.	hand..	lghtg..	.....	
Riker	B	3	4,600	150	Prsh..	p-stl..	rigid..	sol....	36x5	36x5d	Jns..	wd....	own...	4-4½x6 -29.0	2	cent...	own...	cst.....	G&O*.	fin.....	sing..	Berlg..	hand..	s&l-2..	West .	225
Riker	BB	4	4,700	150	Prsh..	p-stl..	rigid..	sol....	36x5	36x6d	Jns..	wd....	own...	4-4½x6 -29.0	2	cent...	own...	cst.....	G&O*.	fin.....	sing..	Berlg..	hand..	s&l-2..	West .	225
Rock Falls	9	1½	.....	150	Smh..	p-stl..	rigid..	pnu....	35x5	35x5	Mut..	wd....	Buda..	6-3½x5½-29.5	6	cent...	S-W..	cst.....	S-W..	cel.....	sing..	Bosch.	hand..	s&l-2 .	West..	none
Rowe	C.D.W.	2	3,300	....	own...	rol-c..	rigid..	sol....	34x4	36x7	H&D.	wd....	Wsc...	4-4 x5 -25.6	4	cent...	Fed...	sht.....	M-R..	.....	.....	Bosch.	.....	none..	none..	none
Rowe	C.D.W.	2½	3,575	....	own...	rol-c..	rigid..	sol....	34x4	36x4d	H&D.	wd....	Wsc...	4-4 x5 -25.6	4	cent...	Fed...	sht.....	M-R..	.....	.....	Bosch.	.....	none..	none..	none
Rowe	D.E.W.	3	3,900	....	own...	rol-c..	rigid..	sol....	36x5	36x5d	H&D.	wd....	.....	4-4 x6 -25.6	4	cent...	Fed...	sht.....	M-R..	.....	.....	Bosch.	.....	none..	none..	none
Rowe	D.G.W.	3	4,950	170	own...	rol-c..	.....	pnu....	38x7	42x9	own*..	mt*..	H-S..	8-3½x5 -33.8	..	cent...	M-R..	sht.....	M-R..	cel.....	.....	A-Knt	auto..	sl&i...	West..	none
Rowe	F.W.	5	5,390	....	own...	rol-c..	rigid..	sol....	36x6	40x6d	H&D.	wd....	Wsc...	4-4½x5½-36.2	2	cent...	Fed*..	sht.....	.....	.....	.....	Bosch.	.....	.....	.....	.....
Sandow	C	1	1,895	120	Savg..	p-stl..	flex....	sol*...	34x3½	34x5	Stan..	wd....	Con...	4-3½x5 -19.6	4	ther...	own...	cst.....	Chgo..	fin.....	sing..	Eismn.	auto..	lghtg..	.....	125
Sandow	I	2	1.395	150	Savg..	p-stl..	s-flex..	sol*...	36x4	36x6	Stan..	wd....	Con...	4-3½x5 -22.5	4	cent...	own...	cst.....	Chgo..	fin.....	sing..	Eismn.	auto..	.....	.....	.....
Sandow	CG	1½	2,090	135	Savg..	p-stl..	flex....	sol*...	34x3½	34x5	Stan..	wd....	Con...	4-3½x5 -22.5	4	cent...	own...	cst.....	Chgo..	fin.....	sing..	Eismn.	auto..	.....	.....	.....
Sandow	J	2½	2,975	165	Savg..	p-stl..	s-flex..	sol*...	36x4	36x7	Stan..	wd....	Con...	4-4½x5½-27.2	4	cent...	own...	cst.....	Chgo..	fin.....	sing..	Bosch.	auto..	.....	.....	.....
Sandow	M	3½	3,975	175	Savg..	p-stl..	s-flex..	sol....	36x5	36x5d	Stan..	wd....	Con...	4-4½x5½-32.4	2	cent...	own...	cst.....	Chgo..	fin.....	sing..	Bosch.	auto..	.....	.....	.....
Sandow	L	5	4,750	175	Savg..	p-stl..	s-flex..	sol....	36x6	40x6d	Stan..	wd....	Con...	4-4½x5½-32.4	2	cent...	own...	cst.....	Chgo..	fin.....	sing..	Bosch.	auto..	.....	.....	.....
Sanford	25	2½	3,000	156	P&B..	p-stl..	s-flex..	sol....	36x4	36x4d	H&D.	wd....	Con...	4-4½x5½-27.2	4	cent...	own...	cst.....	McC..	fin.....	sing..	Bosch.	hand..	lghtg..	Vesta.	150
Sanford	35	3½	3,975	174	P&B..	p-stl..	s-flex..	sol....	36x5	36x5d	H&D.	wd....	Con...	4-4½x5½-32.4	2	cent...	own...	cst.....	McC..	fin.....	sing..	Bosch.	hand..	lghtg..	Vesta	150
Sanford	50	5	4,750	174	P&B..	p-stl..	s-flex..	sol....	36x5	40x6d	H&D.	wd....	Con...	4-4½x5½-32.4	2	cent...	own...	cst.....	McC..	fin.....	sing..	Bosch.	hand..	lghtg..	Vesta	150
Schacht	2-Ton	2	3,350	144	own...	rol-c..	flex....	sol....	36x4	36x7	Crn...	wd....	Buda..	4-4½x5½-29.0	4	cent...	own...	cst.....	Brem..	pln.....	sing..	Bosch.	hand..	none..	none..	none
Schacht	2½-Ton	2½	3,650	156	own...	rol-c..	flex....	sol....	36x4	36x4d	Crn...	wd....	Buda..	4-4½x5½-29.0	4	cent...	own...	cst.....	Brem..	pln.....	sing..	Bosch.	hand..	none..	none..	none
Schacht	3½-Ton	3½	4,150	168	own...	rol-c..	flex....	sol....	36x5	36x5d	Crn...	wd....	Buda..	4-4½x5½-29.0	4	cent...	own...	cst.....	Brem..	pln.....	sing..	Bosch.	hand..	none..	none..	none
Schacht	5-Ton	5	5,150	168	own...	rol-c..	flex....	sol....	36x5	40x6d	Crn...	wd....	Buda..	4-4½x6 -32.4	4	cent...	own...	cst.....	Brem..	pln.....	sing..	Bosch.	hand..	none..	none..	none
Schwartz	B	1½	2,175	140	Prsh..	p-stl..	s-flex..	sol*...	34x3½	34x5	Sch...	wd....	Con...	4-3½x5 -22.5	4	ther...	own...	cst.....	Fed...	cel.....	sing..	Bosch.	hand..	none..	none..	none
Schwartz	C	2½	2,675	146	Prsh..	p-stl..	s-flex..	sol....	36x4	36x7	Sch...	wd....	Con...	4-4½x5½-27.2	4	cent...	own...	cst.....	Fed...	cel.....	sing..	Bosch.	hand..	none..	none..	none
Schwartz	D	5	4,500	170	Prsh..	p-stl..	s-flex..	sol....	36x6	36x6d	Sth...	mt....	Buda..	4-4½x6 -32.4	4	cent...	own...	cst.....	Fed...	cel.....	sing..	Bosch.	hand..	lghtg..	Bijur..	.....
Selden	1½A	1½	.....	137½	P&B..	p-stl..	rigid..	sol*...	34x3½	35x5	Arch..	wd....	Con...	4-3½x5 -22.5	4	ther...	Lng...	cst.....	Bush..	fin.....	sing..	Bosch.	fixed..	s&l-2..	N-E..	....
Selden	2½2A	2½	.....	145	P&B..	p-stl..	flex....	sol....	36x4	36x7	Stan..	wd....	Con...	4-4½x5½-27.2	4	cent...	Lng...	cst.....	Lng..	fin.....	sing..	Eismn.	hand..	s&l-2..	N-E..	....
Selden	3½2A	3½	.....	162	P&B..	p-stl..	flex....	sol....	36x5	36x10	Stan..	wd....	Con...	4-4½x5½-32.4	2	cent...	Lng...	cst.....	Lng..	fin.....	sing..	Eismn.	hand..	s&l-2..	N-E..	....
Selden	5A	5	.....	164	P&B..	p-stl..	flex....	sol....	36x6	40x12	Stan..	mt....	Con...	4-4½x6 -36.1	2	cent...	Lng...	cst.....	Lng..	fin.....	sing..	Eismn.	hand..	s&l-2..	Conn.	....
Seneca	F-2	¼	1,060	108	P&B..	p-stl..	s-flex..	pnu....	30x3½	30x3½	AWW..	wd....	LeR..	4-3½x4½-15.6	4	ther...	Knz...	prs.....	Knz..	cel.....	sing..	Conn.	hand..	sl&i...	Al-Ch.	none
Service	220	1	2,245	137	own...	p-stl..	flex....	sol....	34x3½	34x5	Bim...	wd....	Buda..	4-3½x5½-19.6	4	ther...	Lng...	cst.....	Lng..	fin.....	sing..	Eismn.	hand..	s&l-2..	West..	165
Service	31	1½	2,785	150	own...	p-stl..	flex....	sol....	36x3½	36x6	Bim...	wd....	Buda..	4-4 x5½-25.6	4	cent...	Lng...	cst.....	Lng..	fin.....	sing..	Eismn.	hand..	s&l-2..	West..	165
Service	36	1½	3,215	150	own...	p-stl..	flex....	pnu....	35x5	38x7	Bim...	wd....	Buda..	4-4½x5½-29.0	4	cent...	Lng...	cst.....	Lng..	fin.....	sing..	Eismn.	hand..	s&l-2*.	West..	165
Service	51	2½	3,245	160	own...	p-stl..	flex....	sol....	36x4	36x7	Bim...	wd....	Buda..	4-4½x5½-29.0	4	cent...	Lng...	cst.....	Lng..	fin.....	sing..	Eismn.	hand..	s&l-2..	West..	165
Service	76	3½	4,285	171	own...	p-stl..	flex....	sol....	36x5	36x5d	Bim...	wd....	Buda..	4-4½x6 -32.4	4	cent...	Lng...	cst.....	Lng..	fin.....	sing..	Eismn.	hand..	s&l-2..	West..	165
Service	101	5	5,145	171½	own...	p-stl..	flex....	sol....	36x6	40x6d	Sth...	mt....	Buda..	4-4½x6 -32.4	4	cent...	Lng...	cst.....	Lng..	fin.....	sing..	Eismn.	hand..	s&l-2..	West..	165
Signal	F	1	2,650	146	Savg..	p-stl..	s-flex..	sol....	34x3½	36x6	Hay..	wd....	Con...	4-4½x5½-27.2	4	cent...	own...	cst.....	McC..	fin.....	sing..	Eismn.	fixed..	lghtg-2	Nich..	80
Signal	H	1½	2,850	146	Savg..	p-stl..	s-flex..	sol....	34x4	36x6	Hay..	wd....	Con...	4-4½x5½-27.2	4	cent...	own...	cst.....	McC..	fin.....	sing..	Eismn.	fixed..	lghtg-2	Nich..	80
Signal	J	2	3,200	150	Savg..	p-stl..	s-flex..	sol....	36x6	36x8	Hay..	wd....	Con...	4-4½x5½-27.2	4	cent...	own...	cst.....	McC..	fin.....	sing..	Eismn.	fixed..	lghtg-2	Nich..	80
Signal	M	3½	4,200	168	Savg..	p-stl..	s-flex..	sol....	36x5	40x5d	Hay..	wd....	Con...	4-4½x5½-32.4	2	cent...	own...	cst.....	McC..	fin.....	sing..	Eismn.	fixed..	lghtg-2	Nich..	80

ABBREVIATIONS—Types of Construction

*—other options
amid—amidship
auto—automatic
bevl—bevel
cel—cellular
cent—centrifugal
chn—chain
cst—cast
ctr—center
cylinders cast, 2 in pairs
cylinders cast, 4 in block
cylinders cast, 3 in threes
cylinders cast, 1 singly
cyl-ends—cylinder-ends
d—dual
d-d—dry-disk
d-p—dry-plate
dplx—from both motor & driveshaft
d-rd—double reduction
d-s—drive-shaft
elec—electric
ext-d-s—external drive-shaft
ext-f-w—external front wheel
ext-g—external gear
ext-jst—external jack-shaft
ext-r-w—external rear wheel
fab—fabric
fin—finned tube
flex—flexible
fric—friction
g-p—gear pump
grv—gravity
gset—from gearset
hyd—hydraulic
ind-c—individual clutch
int-g—internal gear
int-g-4—internal gear drive on 4 wheels
int-r-w—internal rear wheel
jst—unit with jackshaft
l—left
l-b—loose ball
lghtg—lighting only
motr—unit with motor
mt—metal (wheels)
mtl—metal (universal joint)
opt—optional
pist—piston pump
plan—planetary
pln—plain tube
pnu—pneumatic
pres—pressure
prog—progressive
prs—pressed steel
p&s—pneumatics in front, solids in rear
p-stl—pressed steel
r—right
r&c—right & center
r-rd—radius rods
rol-c—rolled channel
rol-i—rolled I-beam
selec—selective
s-flex—semi-flexible
sht—sheet
s&l—starting & lighting
sl&i-2—starting, lighting & ignition, 2 unit
sol—solid
sprgs—springs
sq-t—square-tube
start—starting only
t-arm—torque arm
ther—thermo-syphon
t-p—two-point
t-t—torsion tube
vac—vacuum
wat-tube—water tube
wd—wood
w-d—multiple disk in oil
w-p—plate in oil
wr—wire
zz-t—zig-zag tube

ABBREVIATIONS—Makers of Parts

*Other Options
Acme—Acme Universal Joint Mfg. Co.
A-Knt—Atwater-Kent
Al-Ch—Allis-Chalmers
Aloy—Alloy Steel Spring
Amer—American Magneto Co.
Arch—Archibald
Arvac—Arvac Co.
Aut-L—Auto-Lite
Auto—Auto-Wheel Co.
A-W-W—Automotive Wire Wheel Co.
B&B—Ball & Ball
B-Beck—Borg & Beck
Berlg—Berling
Bet—Betts Spring Co.
Bim—Bimel
B-Lipe—Brown-Lipe
Blood—Blood Bros.
Brem—Bremer
Bvr—Beaver Mfg. Co.
B&W—B & W Mfg. Co.
Can—Candler Radiator
Cant—Canton-Cleveland
Carl—Carleton Co.
Cart—Carter Carburetor
Cas—G. M. Castle
CAS—C. A. S. Products
Chgo—Chicago Mfg. Co.
Chic—Chicago-Standard
Chmp—Champion Auto Spring Co.
Chy—Cheney
Clrk—Clark Equipment
Col—Columbia Axle Co.
Con—Continental Motor
Conn—Connecticut
Crn—Crane & Mac-Mahon Co.
C-S—Christopher Simpson Iron Co.
Day—Dayton
Del—Delaney
Detlaf—Detlaff

Gasoline Motor Trucks for 1920—Cont.

ENGINE									TRANSMISSION									Springs Make	BRAKES		CONTROL			UNIVERSALS		Name and Model
GOVERNOR			SPEED		FUEL SYS.		CLUTCH		GEARSET				FINAL DRIVE								STEERING GEAR					
Type	Make	Drive	Motor in r.p.m.	Truck in m.p.h.	Carbureter Make	Fuel Feed	Type	Make	Type	Make	Placed	Speeds	Type	Rear Axle Make	Total Gear Reduction	Propulsion Taken By	Torque Taken By		Foot	Hand	Placed	Make	Levers	Type	Make	
cent.	own...	motor	1000	12	own...	pres..	d-d...	own...	selec...	own...	amid..	4	worm.	own....	10.00	r-rd...	t-arm.	Sp-P..	ext-d-s..	int-r-w	l...	own...	l&c.	mtl*	Spicer*	Packard 4-B
cent.	own...	motor	1000	11	own...	pres..	d-d...	own...	selec...	own...	amid..	4	worm.	own....	10.66	r-rd...	t-arm.	Sp-P..	ext-d-s..	int-r-w	l...	Ross..	l&c.	mtl*	Spicer*	Packard 5-B
cent.	own...	motor	1000	11	own...	pres..	d-d...	own...	selec...	own...	amid..	4	worm.	own....	10.66	r-rd...	t-arm.	Sp-P..	ext-d-s..	int-r-w	l...	Ross..	l&c.	mtl*	Spicer*	Packard 6-B
cent.	Dplx...	motor	1200	15	Stmbg.	grv...	d-d...	B-Lipe.	selec...	B-Lipe.	amid..	4	worm.	Timkn.	8.5	r-Rod	sprgs..	Perf..	int-r-w..	int-r-w	l...	Jacox.	ctr..	mtl..	Spicer..	Paige 50-1
cent.	Dplx...	motor	1050	11	Stmbg.	grv...	d-d...	B-Lipe.	selec...	B-Lipe.	amid..	4	worm.	Timkn.	10.3	r-Rod	sprgs..	Perf..	int-r-w..	int-r-w	l...	Jacox.	ctr..	mtl..	Spicer..	Paige 51-1
suct..	Mnrch.	motor	1250	18	Stmbg.	grv...	d-d...	B-Lipe.	selec...	Fuller..	amid..	4	worm.	own....	7.75	r-rd...	sprgs..	Tuth..	ext-d-s..	int-r-w	l...	Ross..	ctr..	mtl*	Arvac*	Parker F9 W
suct..	Mnrch.	motor	1030	16	Stmbg.	grv...	d-d...	B-Lipe.	selec...	Warn..	amid..	4	worm.	own....	7.80	r-rd...	sprgs..	Tuth..	ext-d-s..	int-r-w	l...	Ross..	ctr..	mtl*	K-B*...	Parker J
cent.	Con...	motor	1100	12	Stmbg.	vac...	d-d...	B-Lipe.	selec...	Warn..	amid..	4	worm.	Timkn.	10.25	r-rd...	sprgs..	Tuth..	ext-d-s..	int-r-w	l...	Ross..	ctr..	mtl*	K-B*...	Parker M
cent.	own...	motor	1300	16	own...	grv...	cone..	own...	selec...	own...	amid..	4	worm.	own....	8.25	r-rd...	t-arm.	Sp-P..	ext-d-s..	int-r-w	r...	own...	r...	mtl..	own...	Pierce-Arrow X
cent.	own...	motor	1185	14	own...	grv...	cone..	own...	selec...	own...	amid..	3	worm.	own....	9.75	r-rd...	t-arm.	Sp-P..	ext-d-s..	int-r-w	r...	own...	r...	mtl..	own...	Pierce-Arrow R
cent.	Pierce..	gset...	1500	16	Stmbg.	grv...	d-d...	B-Lipe.	.....	B-Lipe.	amid..	4	worm.	Timkn.	8.75	r-rd...	sprgs..	S-P...	int.....	int-r-w	l...	Ross..	ctr..	mtl..	Spicer..	Pioneer All Steel F
opt.	opt....	opt...	1250	25	Stmbg.	grv...	none..	.....	fric....	.....	jst....	3	chn...	own....	4.00	r-rd...	.....	Tuth..	int.....	.....	l...	own...	l....	.....	.....	Pony
cent.	Pierce..	motor	1200	15	Stmbg.	grv...	d-d...	Fuller..	selec...	Fuller..	motr..	4	worm.	Timkn.	7.75	sprgs..	Sprgs.	Detr..	int-r-w	int-r-w	l...	Ross..	ctr..	mtl..	Univl..	Power B
suct..	Mnrch.	motor	1800	25	Zenith.	vac...	d-d...	B-Lipe.	selec...	B-Lipe.	motr..	3	worm.	Timkn.	7.20	sprgs..	sprgs..	S-P...	int-r-w	int-r-w	l...	Lavn..	ctr..	mtl..	Hart...	Rainier R-1
suct..	Mnrch.	motor	1800	20	Zenith.	vac...	d-d...	B-Lipe.	selec...	B-Lipe.	motr..	3	worm.	Shel...	7.80	sprgs..	sprgs..	S-P...	int-r-w	int-r-w	l...	Lavn..	ctr..	mtl..	Hart...	Rainier R-9
suct..	Mnrch.	motor	1800	20	Zenith.	vac...	d-d...	B-Lipe.	selec...	B-Lipe.	motr..	3	worm.	Shel...	7.80	sprgs..	sprgs..	S-P...	int-r-w	int-r-w	l...	Lavn..	ctr..	mtl..	Hart...	Rainier R-6
suct..	Mnrch.	motor	1800	15	Zenith.	vac...	d-d...	B-Lipe.	selec...	B-Lipe.	motr..	3	worm.	Shel...	8.70	sprgs..	sprgs..	S-P...	int-r-w	int-r-w	l...	Ross..	ctr..	mtl..	Hart...	Rainier R-8
none.	none..	none..	.....	22	John...	grv...	d-d...	own...	selec...	own...	amid..	3	bevel..	own....	4.66	sprgs..	t-arm.	Penn..	ext-r-w..	int-r-w	l...	own...	l&c.	mtl..	own...	Reo F
suct..	own...	motor	1200	17	Stmbg.	grv...	d-d...	Fuller..	selec...	Fuller..	motr..	3	int-g..	Torbn..	7.15	sprgs..	sprgs..	Mth*.	ext-r-w..	int-r-w	l...	Sag...	ctr..	mtl..	Spicer..	Republic 10
suct..	own...	motor	1200	15	Stmbg.	grv...	d-d...	Fuller..	selec...	Fuller..	motr..	3	int-g..	Torbn..	8.00	sprgs..	sprgs..	Mth*.	ext-r-w..	int-r-w	l...	Sag...	ctr..	mtl..	Spicer..	Republic 11
cent.	Pharo..	motor	1000	12	Stmbg.	grv...	d-d...	Fuller..	selec...	Fuller..	motr..	4	int-g..	Torbn..	8.00	sprgs..	sprgs..	Mth*.	ext-r-w..	int-r-w	l...	Sag...	ctr..	mtl..	Spicer..	Republic 19
cent.	Pharo..	motor	1150	12	Stmbg.	grv...	d-d...	Fuller..	selec...	Fuller..	motr..	4	int-g..	Torbn..	10.26	sprgs..	sprgs..	Mth*.	int-r-w..	ext-d-s	l...	Sag...	ctr..	mtl..	Spicer..	Republic 20
l-b...	own...	motor	1350	14	B&B...	grv...	cone..	own...	selec...	own...	amid..	4	worm.	own....	10.00	r-rd...	t-arm.	Sp-P..	ext-d-s..	int-r-w	r...	Ross..	r...	mtl..	own...	Riker B
l-b...	own...	motor	1350	14	B&B...	grv...	cone..	own...	selec...	own...	amid..	4	worm.	own....	10.00	r-rd...	t-arm.	Sp-P..	ext-d-s..	int-r-w	r...	Ross..	r...	mtl..	own...	Riker BR
none.	none...	none..	2200	50	Rayfld.	vac...	d-p...	B-Beck.	prog...	G-Lees.	motr..	3	bevel..	Col....	4.67	sprgs..	t-arm.	Tuth..	ext-r-w..	int-r-w	l...	Gem..	l&c.	mtl..	Spicer..	Rock Falls 9
cent.	Dplx...	motor	.....	.....	Zenith.	grv...	w-d...	B-Lipe.	selec...	B-Lipe.	motr..	4	worm.	Timkn.	.....	r-rd...	sprgs..	Shel...	r-w.....	r-w.....	l...	Ross..	ctr..	mtl..	Arvac..	Rowe C.D.W
cent.	Dplx...	motor	.....	.....	Zenith.	grv...	w-d...	B-Lipe.	selec...	B-Lipe.	motr..	4	worm.	Shel...	.....	r-rd...	sprgs..	Shel...	r-w.....	r-w.....	l...	Ross..	ctr..	mtl..	Arvac..	Rowe C.D.W
cent.	Dplx...	motor	.....	.....	Zenith.	grv...	w-d...	B-Lipe.	selec...	B-Lipe.	motr..	4	worm.	Shel...	.....	r-rd...	sprgs..	Shel...	r-w.....	r-w.....	l...	Ross..	ctr..	mtl..	M&E..	Rowe D.E.W
none.	none...	none...	.....	.....	Zenith.	vac...	w-d...	B-Lipe.	selec...	B-Lipe.	motr..	4	worm.	Shel...	.....	r-rd...	.....	Shel...	r-w.....	r-w.....	l...	Ross..	ctr..	mtl..	M&E..	Rowe D.G.W
cent.	Dplx...	motor	.....	.....	Zenith.	grv...	w-d...	B-Lipe.	selec...	B-Lipe.	amid..	4	worm.	Shel...	.....	r-rd...	sprgs..	Shel...	r-w.....	r-w.....	l...	Ross..	ctr..	mtl..	M&E..	Rowe F.W
.....	.....	.....	1200	15	Stmbg.	grv...	d-d...	Fuller..	selec...	Fuller..	motr..	3	worm.	Shel...	6.05	sprgs..	sprgs..	GCS..	int.....	int-r-w	l...	Ross..	ctr..	mtl..	Spicer*	Sandow C
.....	.....	.....	1200	15	Stmbg.	grv...	d-d...	Fuller..	selec...	Fuller..	motr..	3	worm.	Shel...	7.80	sprgs..	sprgs..	GCS..	int-r-w	int-r-w	l...	Ross..	ctr..	mtl..	Spicer*	Sandow I
suct..	.....	motor	1000	15	Stmbg.	grv...	d-d...	B-Lipe.	selec...	B-Lipe.	motr..	4	worm.	Timkn.	9.25	sprgs..	sprgs..	GCS..	int-r-w	int-r-w	r...	Ross..	ctr..	mtl..	Spicer*	Sandow CG
suct..	.....	motor	1100	15	Stmbg.	grv...	.....	B-Lipe.	selec...	B-Lipe.	amid..	4	worm.	Timkn.	9.25	r-rd...	sprgs.	GCS..	int-r-w	int-r-w	r...	Ross..	ctr..	mtl..	Spicer*	Sandow J
suct..	.....	motor	1200	12	Stmbg.	grv...	d-d...	B-Lipe.	selec...	B-Lipe.	amid..	4	worm.	Timkn.	13.66	r-rd...	sprgs.	GCS..	int-r-w	int-r-w	r...	Ross..	ctr..	mtl..	Spicer*	Sandow M
.....	.....	.....	1350	15	Stmbg.	grv...	d-d...	Fuller..	selec...	Fuller..	motr..	3	int-g..	Torbn..	10.00	sprgs..	sprgs..	GCS..	ext-r-w..	int-r-w	l...	Ross..	.....	mtl..	Spicer*	Sandow L
cent.	Pierce..	motor	1000	12	Stmbg.	grv...	d-p...	B-Beck.	selec...	B-Lipe.	amid.	4	worm.	Shel...	8.75	sprgs..	sprgs..	S-P...	int-r-w	int-r-w	l...	Ross..	ctr..	mtl*	Spicer*	Sanford 25
cent.	Pierce..	motor	1000	12	Stmbg.	grv...	d-p...	B-Beck.	selec...	B-Lipe.	amid.	4	worm.	Shel...	8.75	sprgs..	sprgs..	S-P...	int-r-w	int-r-w	l...	Ross..	ctr..	mtl*	Spicer*	Sanford 35
cent.	Pierce..	motor	1000	10	Stmbg.	grv...	d-p...	B-Beck.	selec...	B-Lipe.	amid.	4	worm.	Shel...	11.70	sprgs..	sprgs..	S-P...	int-r-w	int-r-w	l...	Ross..	ctr..	mtl*	Spicer*	Sanford 50
cent.	Dplx...	motor	1000	16	Schblr.	grv...	cone..	Hart...	selec...	own...	amid..	3	worm.	own....	8.66	r-rd...	t-arm.	Nat...	ext-d-s	int-r-w	l...	own...	ctr..	.....	.....	Schacht 2-Ton
cent.	Dplx...	motor	1000	14	Schblr.	grv...	cone..	Hart...	selec...	own...	amid..	3	worm.	own....	9.66	r-rd...	t-arm.	Nat...	ext-d-s	int-r-w	l...	own...	ctr..	.....	.....	Schacht 2½-Ton
cent.	Dplx...	motor	1000	12	Schblr.	grv...	cone..	Hart...	selec...	own...	amid..	3	worm.	own....	10.33	r-rd...	t-arm.	Nat...	ext-d-s	int-r-w	l...	own...	ctr..	.....	.....	Schacht 3½-Ton
cent.	Dplx...	motor	1000	20	Schblr.	grv...	cone..	Hart...	selec...	own...	amid..	8	worm.	own....	10.33	r-rd...	t-arm.	Nat...	ext-d-s	int-r-w	l...	own...	ctr..	.....	.....	Schacht 5-Ton
cent.	Pierce..	motor	1200	16	Stmbg.	grv...	d-d...	B-Lipe.	selec...	B-Lipe.	motr..	3	int-g..	Torbn..	7.50	sprgs..	sprgs..	Rowl..	ext-r-w..	ext-r-w	l...	Ross..	ctr..	mtl..	Hart...	Schwartz B
cent.	Pierce..	motor	1000	14	Stmbg.	grv...	d-d...	B-Lipe.	selec...	B-Lipe.	motr..	3	int-g..	Torbn..	8.10	sprgs..	sprgs..	Rowl..	ext-r-w..	int-r-w	l...	Ross..	ctr..	mtl..	Hart...	Schwartz C
cent.	Dplx...	motor	1000	12	Stmbg.	grv...	d-d...	B-Lipe.	selec...	B-Lipe.	motr..	4	int-g..	Torbn..	10.20	sprgs..	sprgs..	Rowl..	int-r-w..	ext-d-s	l...	Ross..	ctr..	mtl..	Hart...	Schwartz D
cent.	Pierce..	motor	1240	18	Stmbg.	grv...	d-d...	B-Lipe.	selec...	B-Lipe.	motr..	3	worm.	Timkn.	7.00	sprgs..	sprgs..	S-P...	int-r-w	int-r-w	l...	Lavn..	ctr..	mtl..	Spicer..	Selden 1½A
cent.	Pierce..	motor	1148	16	Stmbg.	grv...	d-d...	B-Lipe.	selec...	B-Lipe.	amid..	4	worm.	Timkn.	7.75	r-rd...	sprgs.	S-P...	int-r-w	int-r-w	r...	Gem..	ctr..	mtl..	Spicer..	Selden 2½A
cent.	Pierce..	motor	1125	14	Stmbg.	grv...	d-d...	B-Lipe.	selec...	B-Lipe.	amid..	4	worm.	Timkn.	8.75	r-rd...	sprgs.	S-P...	int-r-w	int-r-w	r...	Gem..	ctr..	mtl..	Spicer..	Selden 3½A
cent.	Pierce..	motor	1100	13	Stmbg.	grv...	d-d...	Detl'f.	selec...	B-Lipe.	amid..	4	worm.	Timkn.	10.25	r-rd...	sprgs.	S-P...	int-r-w	int-r-w	r	Gem..	ctr..	mtl..	Spicer..	Selden 5A
none.	none...	none..	2200	40	Schblr.	vac...	d-d...	Detrt..	selec...	Detrt..	motr..	3	bevel..	Peru...	4.5	sprgs.	t-arm.	Mth..	ext-r-w..	int-r-w	l...	Ditw..	ctr..	mtl..	Unvsl..	Seneca F-2
none.	none...	none..	.....	.....	Stmbg.	vac...	d-d...	Fuller..	selec...	Fuller..	motr..	3	worm.	Timkn.	7.75	sprgs..	sprgs..	Mth..	int-r-w..	int-r-w	l...	Ross..	ctr..	mtl..	Arvac..	Service 220
cent.	Simp...	motor	1100	15	Stmbg.	grv...	d-p...	B-Beck.	selec...	B-Lipe.	amid..	4	worm.	Timkn.	6.80	sprgs..	sprgs..	Mth..	int-r-w..	int-r-w	l...	Ross..	ctr..	mtl*	Spicer*	Service 31
cent.	Simp...	motor	1100	18	Stmbg.	grv...	d-p...	B-Beck.	selec...	B-Lipe.	amid..	4	worm.	Timkn.	6.80	sprgs..	sprgs..	Mth..	int-r-w..	int-r-w	l...	Ross..	ctr..	mtl*	Spicer*	Service 36
cent.	Simp...	motor	1100	14	Stmbg.	grv...	d-p...	B-Beck.	selec...	B-Lipe.	amid..	4	worm.	Timkn.	7.75	sprgs..	sprgs..	Mth..	int-r-w..	int-r-w	l...	Ross..	ctr..	mtl*	Spicer*	Service 51
cent.	Simp...	motor	1000	14	Stmbg.	grv...	d-p...	B-Beck.	selec...	B-Lipe.	amid..	4	worm.	Timkn.	7.80	r-rd...	sprgs..	Mth..	int-r-w..	int-r-w	l...	Ross..	ctr..	mtl*	Spicer*	Service 76
cent.	Simp...	motor	1000	11	Stmbg.	grv...	d-p...	B-Beck.	selec...	B-Lipe.	amid..	4	worm.	Timkn.	10.25	r-rd...	sprgs..	Mth..	int-r-w..	int-r-w	l...	Ross..	ctr..	mtl*	Spicer*	Service 101
cent.	Pierce..	gset..	1188	15	Stmbg.	grv...	d-d...	B-Lipe.	selec...	B-Lipe.	amid..	4	worm.	Timkn.	7.75	r-rd...	sprgs..	Detr..	int-r-w..	int-r-w	l...	Ross..	ctr..	mtl..	Spicer..	Signal F
cent.	Pierce..	gset..	1400	15	Stmbg.	grv...	d-d...	B-Lipe.	selec...	B-Lipe.	amid..	4	worm.	Timkn.	9.25	r-rd...	sprgs..	Detr..	int-r-w..	int-r-w	l...	Ross..	ctr..	mtl..	Spicer..	Signal H
cent.	Pierce..	gset..	1400	15	Stmbg.	grv...	d-d...	B-Lipe.	selec...	B-Lipe.	amid..	4	worm.	Timkn.	12.0	r-rd...	sprgs..	Detr..	int-r-w..	int-r-w	l...	Ross..	ctr..	mtl..	Spicer..	Signal J
cent.	Pierce..	gset..	1516	15	Stmbg.	grv...	d-d...	B-Lipe.	selec...	B-Lipe.	amid..	4	worm.	Timkn.	9.25	r-rd...	sprgs..	Detr..	int-r-w..	int-r-w	l...	Ross..	ctr..	mtl..	Spicer..	Signal M

ABBREVIATIONS—Makers of Parts—(Continued)—

Detrt—Detroit G. & M.
Ditw—Ditwiler Mfg. Co.
Dneto—Dyneto
Drt—Detroit Pressed Steel Co.
Dtr—Detroit Products
Dtrt—Detroit Lubricator
Dun—Dunbar Mfg. Co.
Dur—Durston Gear Corp.
E&M—English & Mersick
E&O—Eberly & Orris
Eismn—Eisemann
Ens—Ensign Carburetor
Eric—Ericsson Mfg. Co.
Eurk—Eureka
F&H—French & Hecht
FAC—F. A. Chapper
Fed—Fedders
Flx—Flexo Mfg. Co.
Frank—Francke Co.
G&D—Gray & Davis
G&O—G & O Mfg. Co.
GCS—Garden City Springs
Gem—Gemmer
G-Lees—Grant-Lees
Grn—Greens Car Wheel
H&D—Hoopes Bros. & Darlington
Har—Harrison
Hart—Hartford
Harv—Harvey
Hay—Hayes Wheel Co.
Her—Hercules
Hig—Higgins
Hink—Hinkley
Hol—Holley
H-Shaw—Hele-Shaw
H-S—Herschell-Spillman
Hyd—Hydraulic
Idl—Ideal
Ind—Indestructible
Iron—Iron City
Jacox—Jackson-Church-Wilcox
Jck—Jackson Auto
Jns—Phineas Jones & Co.
John—Johnson Co.
Kal—Kalamazoo
Kel—Kelsey Wheel Co.
Ken—Kenosha Wheel &
Knz—Kuntz
Lavn—Lavine
LeR—Le Roi
Lght—Light Mfg. Co.
L-N—Leece-Neville Co.
Lng—Long
Lvgn—Livingston
Lyc—Lycoming
Marvl—Marvel
Mas—F. C. Mason & Co.
Mast—Master
McCn—McCanna
M&E—Merchant & Evans
McC—McCord
Mech—Mechanics Mach. Co.
Merl—Merrill Spring Co.
Miller—H. A. Miller
Mnrch—Monarch
Mod—Modine Mfg. Co.
Mot—Mott Wheel Wks.
M-R—Marlin-Rockwell
MSC—Massillon
Mth—Mather
Mut—Mutual Wheel Co.
Nat—National Spring
Natl—National Can Co.
N-E—North East
Nich—Nichols Elec. Co.
P&B—Parish & Bingham
Perk—Perkins
Pet—Peters Mach. Co.
Pfx—Perfex Radiator
Phil—Philadelphia
Phro—Pharo Mfg. Co.
Prsh—Parish Mfg. Co.
Prud—Prudden
Rayfld—Rayfield
Rem—Remy
Rowl—Wm. H. Rowland
Roy—Royer Wheel Co.
R-T—Rome-Turney
Rugl—Ruggles
Rus—Russel Car & Frdy.
Russl—Russel Axle Co.
Rut—Rutenber
R&V—Root & VanDervoort
Sag—Saginaw
Sal—Salisbury
Savg—Savage Arms
Sch—Schwarz Wheel Co.
Schblr—Schebler
Shel—Sheldon
Simp—Simplex
S-J—Shotwell-Johnson
S-M—Standard Malle-
Smh—A. O. Smith
Sth—Smith Steel Wheel
S-P—Standard Parts Co.
Spltf—Splitdorf
Sp-P—Spring Perch Co.
Stan—Standard Radiator
Stand—Standard Steel Spring Co.
Sterl—Sterling Bearings
Stmbg—Stromberg
Stn—Standard Wheel Co.
S-W—Sparks-Withington
Sum—Sumter Elec. Co.
Therm—Thermoid
Timkn—Timken
Torbn—Torbensen
Tuth—Tuthill
Univl—Universal Prdts.
Unv—Universal
Unvsl—Universal Mach.
U. S.—U. S. Spring Co.
Wag—Wagner
Warn—Warner
Wau—Waukesha
West—Westinghouse
Wil-B—Wilcox Bennett
Wis—Wisconsin Parts
W-L—Ward-Leonard
W&L—Waterhouse & Lester Co.
Way—Wayne Wheel Co.
Wol—Wohlrab
Wsc—Wisconsin
Yng—Youngstown Pressed Steel Co.

Detailed Technical Specifications of

Name and Model	Tons Capacity	Chassis Price	Wheelbase, Inches	FRAME			TIRES			WHEELS		ENGINE				COOLING					IGNITION			ELEC. SYSTEM		
								Size in Ins.								Radiator										
				Make	Materia	Type	Kind	Front	Rear	Make	Type	Make	No. Cyl. Bore and Stroke—N.A.C.C. Hp.	Cylinders Cast	Water Circ.	CASE Make	CASE Type	CORE Make	CORE Type	Type	Make	Spark Advance	Type	Make	Extra Cost $
Signal R	5	5,300	180	Savg.	p-stl.	s-flex.	sol.	36x6	40x6d	Sth.	mt.	Con.	4-4½x6 -36.2	2	cent.	own.	cst.			sing.	Eismn.	hand.	lghtg-2	Nich.	80
Southern A	1	1,495		P&B.			sol*	34x4	34x4		wd.	Buda.	4-3½x5½-19.6	1			cst.			sing.	Delco.	hand.			
Southern B	1½	1,795		P&B.	p-stl.		sol*	34x4	34x4	Bim.	wd.	Con.	4-3¼x5 -22.5	1			cst.				Delco.	hand.			
Standard 56	1	2,250	134	Prsh.	p-stl.	s-flex.	sol*	34x3½	34x4	opt.	wd.	Con.	4-3¼x5 -22.5	4	cent.	Lng.	cst.	Lng.	fin.	sing.	Eismn.	fixed.			
Standard 76	2½	3,200	140	own.	rol-c.		sol.	36x4	36x6	opt.	wd.	Con.	4-4½x5½-27.2	4	cent.	Lng.	cst.	Lng.	fin.	sing.	Eismn.	fixed.			
Standard 66	3½	4,200	160	opt.	p-stl.	s-flex.	sol.	36x5	36x5d	opt.	wd.	Con.	4-4½x5½-32.4	2	cent.	Lng.	cst.	Lng.	fin.	sing.	Eismn.	fixed.			
Standard 86	5	5,000	160	opt.			sol.	36x6	40x6d	Day.	mt.	Con.	4-4½x5½-32.4	2	cent.	Lng.	cst.	Lng.	fin.	sing.	Eismn.	fixed.	none.	none.	none
Sterling 1½	1½	2,480	142	Smh.	p-stl.	s-flex.	opt.	36x3½	36x5	Way.	wd*	own.	4-4 x5½-25.6	2	cent.	own.	cst.	opt.	cel.	sing.	Eismn.	hand.	s&l-2.	West.	
Sterling 2½	2½	3,475	156	Smh.	p-stl.	s-flex.	opt.	36x4	36x4d	Way.	wd*	own.	4-4½x5½-30.7	2	cent.	own.	cst.	opt.	cel.	sing.	Eismn.	hand.	s&l-2.	West.	
Sterling 3½	3½	4,550	162	Smh.	p-stl.	s-flex.	sol.	36x5	40x5d	Way.	wd*	own.	4-4½x6½-32.4	2	cent.	own.	cst.	opt.	cel.	sing.	Eismn.	hand.	s&l-2.	West.	
Sterling 5-W	5	5,350	168	Smh.	p-stl.	s-flex.	sol.	36x6	40x6d	Way.	wd*	own.	4-5 x6½-40.0	2	cent.	own.	cst.	opt.	cel.	sing.	Eismn.	hand.	s&l-2.	West.	
Sterling 5-C	5	5,600	174	Smh.	p-stl.	s-flex.	sol.	36x6	40x5d	Sth.	mt.	own.	4-5 x6½-40.0	2	cent.	own.	cst.	opt.	cel.	sing.	Eismn.	hand.	s&l-2.	West.	none
Sterling 7½	7½	6,000	174	Smh.	p-stl.	s-flex.	sol.	36x6	40x7d	Sth.	mt.	own.	4-5 x6½-40.0	2	cent.	own.	cst.	opt.	cel.	sing.	Eismn.	hand.	s&l-2.	West.	none
Stewart 11	2	1,195	110	Hyd.	p-stl.	rigid	pnu.	32x4	32x4	Way*	wd.	LeR.	4-3½x4½ 15.6	4	ther.	Bush.	cst.	Bush.	pln.	sing.	Eismn.	fixed.	s&l-2.	Fismn.	none
Stewart 8	1	1,650	130	Hyd.	p-stl.	rigid	sol.	34x3½	34x4	Way*	wd.	Con.	4-3½x5 -19.6	4	ther.	Bush.	cst.	Bush.	pln.	sing.	Eismn.	fixed.	lght-2*	Eismn.	75
Stewart 9	1½	1,975	140	Hyd.	p-stl.	rigid	sol.	34x3½	34x5	Way.	wd.	Con.	4-3¼x5 -22.5	4	ther.	Bush.	cst.	Bush.	pln.	sing.	Eismn.	fixed.	lght-2*	Eismn.	75
Stewart 7	2	2,575	156	Hyd.	p-stl.	rigid	sol.	34x4	34x7	Way*	wd.	Con.	4-4½x5½-27.2	4	cent.	Bush.	cst.	Bush.	pln.	sing.	Eismn.	fixed.	lght-2*	Eismn.	75
Stewart 10	3½	3,500	165	Hyd.	p-stl.	rigid	sol.	36x5	36x5d	Clrk.	mt.	Con.	4-4½x5½-32.4	2	cent.	Bush.	cst.	Bush.	pln.	sing.	Eismn.	fixed.	lght-2*	Eismn.	75
Sullivan F	1½	2,350	130	own.	rol-c.		sol.	36x4	36x5	Way.	wd.	Buda.	4-3½x4½-22.5	4	ther.	Bush.	sht.	Bush.	fin.	sing.	Bosch.	fixed.			
Sullivan E	2	2,975	150	P&B.	p-stl.	s-flex.	sol.	36x4	36x7	Way.	wd.	Buda.	4-4½x5½-27.2	4	cent.	own.	cst.	Bush.	fin.	sing.	Bosch.	fixed.			
Sullivan H	3½		170	P&B.	p-stl.		sol.	36x5	36x5d	Way.	wd.	Buda.	4-4½x6 -32.4	4	cent.	own.	cst.	Bush.	fin.	sing.	Bosch.	hand.			
Tiffin GW	1½	2,300	135	P&B.	p-stl.	flex.	sol.	36x3½	36x5	Sth.	mt.	Con.	4-4½x5½-27.2	4	cent.	own.	cst.	G&O.	fin.	sing.	Bosch.	hand.	sl&i.	West.	175
Tiffin MW	2½	3,050	148	P&B.	p-stl.	flex.	sol.	36x4	36x3½d	Sth.	mt.	Con.	4-4½x5½-27.2	4	cent.	own.	cst.	G&O.	fin.	sing.	Bosch.	hand.	sl&i.	West.	175
Tiffin PW	3½	3,980	160	own.	rol-c.	s-flex.	sol.	36x5	36x5d	Sth.	mt.	Con.	4-4½x5½-32.4	2	cent.	own.	cst.	G&O.	fin.	sing.	Bosch.	hand.	sl&i.	West.	175
Tiffin TW	5	5,000	168	own.	rol-i.	rigid	sol.	36x6	40x6d	Sth.	mt.	Con.	4-4½x6 -36.2	2	cent.	own.	cst.	G&O.	fin.	sing.	Bosch.	hand.	sl&i.	West.	200
Tiffin UW	6	5,200	168	own.	rol-i.	rigid	sol.	36x6	40x12	Sth.	mt.	Con.	4-4½x6 -36.2	2	cent.	own.	cst.	G&O.	fin.	sing.	Bosch.	hand.	sl&i.	West.	200
Titan Transport	3½	4,300	162	P&B.	p-stl.	s-flex.	sol*	36x5	40x5d	Day.	mt.	Buda.	4-4½x6 -32.4	4	cent.	own.	cst.	B&W.	zz-t.	sing.	Eismn.	hand.	lghtg.	West.	none
Titan 5-Ton		5,150	156	P&B.	p-stl.	s-flex.	sol*	36x5	40x6d	Clrk.	mt.	Buda.	4-4½x6 -32.4	4	cent.	own.	cst.	B&W.	zz-t.	sing.	Eismn.	hand.	lghtg.	West.	none
Traffic C	2	1,395	132	own.	rol-c.	s-flex.	sol.	34x3½	34x5	Roy.	wd.	Con.	4-3½x5 -22.5	4	ther.	own.	cst.	own.	cel.	sing.	Bosch.	hand.		none.	none
Transport 20	1	1,750	130					34x3½	34x4			Con.	4-3½x5 -22.5	..	ther.				cel.		Eismn.				
Transport 30	1½	2,050	140					36x3½	36x5			Con.	4-3½x5 -22.5	..	ther.				cel.		Eismn.				
Transport 50	2	2,585	150					36x4	36x6			Con.	4-4½x5½-27.2	..	pist.				cel.		Eismn.				
Triangle A	1½	2,185	144	Mas.	rol-c.	s-flex.	sol*	34x3½	34x6	Hay*	wd.	Wau.	4-3½x5½-22.5	4	cent.	Pfx.	prs.	Pfx.	zz-t.	sing.	Eismn.	fixed.	none.	none.	none
Triangle B	2½	2,850	151	Mas.	rol-c.	s-flex.	sol*	36x4	36x7	Roy.	wd.	Rut.	4-4½x5½-27.2	2	cent.	Pfx.	prs.	Pfx.	zz-t.	sing.	Eismn.	hand.	none.	none.	none
Union F	2½	2,675	152	own.	p-stl.	rigid	sol*	36x4	36x7	Prud.	wd.	Wsc.	4-4 x6 -25.6	4	cent.	own.	cst.	G&O.	fin.	sing.	Eismn.	hand.	lghtg.	Eismn	.75
Union H	4	3,500	171	own.	p-stl.	rigid	sol.	36x6	36x10	Sth.	mt.	Wsc.	4-4½x6 -32.4	4	cent.	own.	cst.	G&O.	fin.	sing.	Eismn.	hand.	lghtg.	Eismn.	.75
United A	1½		145		p-stl.	flex.	sol.*	34x3½	34x5		wd.	Buda.	4-3½x5½-22.5	4	cent.	own.	cst.			sing.	Eismn.	hand.			
United B	2½		151		p-stl.	flex.	sol.*	36x4	36x7		wd.	Buda.	4-4½x5½-29.0	4	cent.	own.	cst.			sing.	Eismn.	hand.			
United C	3½		157		p-stl.	flex.	sol.	36x5	36x5d		mt.	Buda.	4-4½x5½-29.0	4	cent.	own.	cst.			sing.	Eismn.	hand.			
United V	5		160		p-stl.	flex.	sol.	36x5	40x6d		mt.	Buda.	4-4½x6 -32.4	4	cent.	own.	cst.			sing.	Eismn.	hand.			
U. S N	1½	2,150	144	own.	p-stl.	flex.	sol*	36x3½	36x5	Sch.	wd.	Con.	4-3½x5 -22.5	4	cent.	Lng.	cst.	Lng.	fin.	sing.	Eismn.	hand.	s&l-2*.	G&D*.	185
U. S H	2½	3,250	144	own.	rol-c.	flex.	sol*	34x4	36x4d	Sch.	wd.	Con.	4-4½x5½-27.2	4	cent.	Fed.	sht.	Fed.	cel.	sing.	Eismn.	hand.	lghtg.	Eismn.	125
U. S J	3½	3,950	162	own.	rol-c.	flex.	sol.	36x5	40x5d	Sch.	wd.	Con.	4-4½x5½-32.4	2	cent.	Fed.	sht.	Fed.	cel.	sing.	Eismn.	hand.	lghtg.	Eismn.	125
U. S K	5	4,850	168	own.	rol-c.	flex.	sol.	36x5	40x6d	Sth*	mt.	Wau.	4-4¼x6½-36.2	2	cent.	Fed.	sht.	Fed.	cel.	sing.	Eismn.	hand.	lghtg.	Eismn.	125
Velie 46	1½	1,925	133	Dun.	p-stl.	s-flex.	sol.	36x3½	36x5	Bim.	wd.	Con.	4-3¼x5 -22.5	4	cent.	own.	cst.	Lng.	fin.	sing.	Bosch.	hand.	none.	none.	none
Velie 26-B	3½	3,900	174	Smh.	p-stl.	s-flex.	sol.	36x5	36x5d	Prud.	wd.	Con.	4-4½x5½-32.4	2	cent.	own.	cst.	R-T.	fin.	sing.	Bosch.	hand.	none.	none.	none
Victor A	1½	1,950	140	own.	rol-c.	rigid	sol*	34x4	34x5	Bim.	wd.	Con.	4-3¼x5 -22.5	4	ther.	Mod.	cst.	Mod.	fin.	sing.	Bosch.	hand.	dual.	Eismn.	fixed.	lghtg.	Eismn.	100
Victor B	2	2,225	140	own.	rol-c.	rigid	sol*	34x4	34x5	Bim.	wd.	Con.	4-3¼x5 -22.5	4	ther.	Mod.	cst.	Mod.	fin.	sing.	Bosch.	hand.	dual.	Eismn.	fixed.	lghtg.	Eismn.	100
Vim 27	½	1,095	103	P&B.	p-stl.	s-flex.	pnu.	31x4	31x4	H&D.	wd.	own.	4-3 x4½-14.4	4	ther.	McC.	prs.	McC.	fin.	sing.	A-Knt	hand.	lghtg.	West.	none
Vim 28	½	1,350	127	P&B.	p-stl.	s-flex.	pnu.	32x4½	32x4½	H&D.	wd.	own.	4-3 x4½-14.4	4	ther.	McC.	prs.	McC.	fin.	sing.	A-Knt	hand.	lghtg.	West.	none
Vim 25	1	2,195	125	P&B.	p-stl.	s-flex.	pnu.	35x5	35x5	H&D.	wd.	Her.	4-3½x5½-22.5	4	g-p.	McC.	cst.	McC.	fin.	sing.	Spltf.	hand.	none.	none.	none
Vim 22	2	3,150	142	P&B.	p-stl.	s-flex.	sol.	36x4	36x6	Sth.	mt.	Her.	4-3½x5½-22.5	4	g-p.	McC.	cst.	McC.	fin.	sing.	Spltf.	hand.	none.	none.	none
Vim 23	3	3,950	175	P&B.	p-stl.	s-flex.	sol.	36x5	36x5d	Sth.	mt.	Her.	4-4¼x5½-28.9	4	cent.	McC.	cst.	McC.	fin.	sing.	Spltf.	hand.	none.	none.	none
Walker-Johnson B	2½	2,890	175	P&B.	p-stl.	s-flex.	sol*	36x4	36x8	Arch.	wd.	Buda.	4-4½x5½-29.0	4	cent.	Bush.	cst.	Bush.	fin.	sing.	Eismn.	hand.	none.	none.	none
Walter. Tractor M.O.-35	3		108	own.	rol-c.	rigid	sol.	40x4d	40x4d	own.	mt.	own.	4-4¾x6 -30.7	4	cent.		sht.			fin.	sing.	Amer.	hand.	none.	none.	none
Walter S	5		168	own.	p-stl.	flex.	sol.	36x6	40x6d	Day.	mt.	Wau.	4-4½x6½-32.4	2	cent.	Bush.	cst.	Bush.	fin.	sing.	Bosch.	hand.	s&l-2.	West.	none
Ward-La France 2B	2½		158	own.	p-stl.	flex.	sol*	36x4	36x7	H&D.	wd.		4-4½x5½-36.2	2	cent.	own.	cst.	Lng.	fin.	sing.	opt.	hand.	lghtg.	vesta.	125
Ward-La France 4A	3½		158	own.	p-stl.	s-flex.	sol*	36x5	36x5d	Steel.			4-4½x6½-32.4	2	cent.	own.	cst.	Lng.	fin.	sing.	opt.	hand.	lghtg.	vesta.	125
Ward-La France 5A	5		160	own.	p-stl.	s-flex.	sol*	36x6	40x6d	Steel.			4-5 x6½-40.0	2	cent.	own.	cst.	Lng.	fin.	sing.	opt.	hand.	glhtg.	vesta	125
Ware A-3½	3½	3,500	136	Drt.	rol-i.		sol.	36x5	36x5d	opt.	wd.	H-S.	4-3½x5 -19.6	4	ther.		cst.		cel.	sing.			none.	none.	
Watson 3½	3½		168	Prsh.	p-stl.	rigid	sol.	36x5	36x10	Crn.	wd.	Con.	4-4½x5½-32.4	2	cent.	own.	cst.	R-T.	fin.	sing.	Simms	hand.	none.	none.	none
White 15	2	2,400	133½		rol-i.	s-flex.	pnu.	34x4½	34x4½		mt.	own.	4-3½-5½-22.5	4	cent.		sht.		cel.	dual.		auto.			
White 30	2	3,300	157½		p-stl.	s-flex.	sol*	36x4*	36x7*		mt.	own.	4-3½x5½-22.5	4	cent.		sht.		cel.	dual.		auto.			
White 40	3	4,300	174		rol-i.	rigid	sol.	36x5	40x5d		mt.	own.	4-3½x5½-22.5	4	cent.	own.	cst.		fin.	dual.		auto.			
White 45	5	5,000	174		rol-i.	rigid	sol.	36x6	40x6d		mt.	own.	4-4½x5½-29.0	4	cent.	own.	cst.		fin.	dual.		auto.			
Wichita L	1½	2,350	144				sol.	36x3½	36x5			own.	4-3½x5 -19.6	..	ther.	Pfx.		Pfx.							
Wichita M	2	2,750	144				sol.	36x4	36x6			Wau.	4-3½x5½-22.5	..	g-p.	Pfx.		Pfx.			Bosch.				
Wichita R	2½	2,950	144				sol.	36x4	36x7			Wau.	4-3½x5½-22.5	..	g-p.	Pfx.		Pfx.							
Wichita O	3½	3,750	165				sol.	36x5	36x5d			Wau.	4-4½x5½-32.4	..	cent.	E-M.		E-M.							
Wichita S	6	5,400	165				sol.	36x6	40x6d			Bvr.	4-4½x6 -32.4	..		E-M.		E-M.							
Wilcox A-1	1		130	Smh.	p-stl.	flex.	pnu*	35x5	35x5	Crn.	wd.	Buda.	4-3½x5½-22.5	4	cent.	own.	cst.	Lng.	fin.	sing.	Bosch.	hand.	lghtg.	none.	none
Wilcox B	1½		144	Smh.	p-stl.	flex.	sol.	36x4	36x5	Sth.	mt.	own.	4-4½x5 -29.0	2	cent.	own.	cst.	Lng.	fin.	sing.	Bosch.	hand.	lghtg.	none.	none
Wilcox C	2½		150	Smh.	p-stl.	flex.	sol.	36x4	36x3½d	Sth.	mt.	own.	4-4½x6-34.0.	2	cent.	own.	cst.	Lng.	fin.	sing.	Bosch.	hand.	lghtg.	none.	none
Wilcox E	3½		162	Smh.	p-stl.	flex.	sol.	36x5	36x5d	Sth.	mt.	Buda.	4-4½x5-29.0	2	cent.	own.	cst.	Lng.	fin.	sing.	Bosch.	hand.	lghtg.	none.	none
Wilcox W	5		162	Smh.	p-stl.	flex.	sol.	36x5	40x6d	Sth.	mt.	Wau.	4-4½x6½-36.2	2	cent.	own.	cst.	Lng.	fin.	sing.	Bosch.	hand.	lghtg.	none.	none
Wilson F	1½	2,450	136		rol-c.	s-flex.	sol.	36x3½	36x5		wd.	Con.	4-3½x5-22.5	4	ther.	own.	cst.	Lng.	fin.	sing.	Eismn.	hand.	lghtg.		
Wilson EA	2½	3,150	152		rol-c.	s-flex.	sol.	36x4	36x7		wd.	Con.	4-4½x5½-27.2	4	cent.	own.	cst.	Lng.	fin.	sing.	Eismn.	hand.	lghtg.		
Wilson G	3½	3,950	160		rol-c.	s-flex.	sol.	36x5	36x5d		mt.	Con.	4-4½x5½-32.4	2	cent.	own.	cst.	Lng.	fin.	sing.	Eismn.	hand.	lghtg.		
Wilson H	5	4,800	160		rol-c.	s-flex.	sol.	36x6	40x6d		mt.	Con.	4-4½x5½-32.4	2	cent.	own.	cst.	Lng.	fin.	sing.	Eismn.	hand.	lghtg.		
Winther-Marwin 430-A	1½		132	own.	rol-c.	s-flex.	sol*	32x4	32x4	own.	mt.	Wsc.	4-3½x5 -22.5	4	cent.	own.	cst.	Brem.	pln.	sing.	Eismn.	hand.	s&l-2*.	Eismn*	
Winther-Marwin 459	2½		152	own.	rol-c.	s-flex.	sol.	34x5	36x6	own.	mt.	Wsc.	4-4 x5 -25.6	4	cent.	own.	cst.	Brem.	pln.	sing.	Eismn.	hand.	s&l-2*.	Eismn*	
Winther-Marwin 479	3½		158	own.	rol-c.	s-flex.	sol.	36x6	36x5d	own.	mt.	Wsc.	4-4½x6 -29.0	4	cent.	own.	cst.	Brem.	pln.	sing.	Eismn.	hand.	s&l-2*.	Bijur.	
Winther 39	1½		140	own.	rol-c.	s-flex.	sol.	34x3½	34x5	own.	mt.	Wsc.	4-3¼x5 -22.5	4	cent.	own.	cst.	Brem.	pln.	sing.	Eismn.	hand.	s&l-2*.	Eismn*	
Winther 49A	2		147	own.	rol-c.	s-flex.	sol.	34x4	34x4d	own.	mt.	Wsc.	4-4 x5 -25.6	4	cent.	own.	cst.	Brem.	pln.	sing.	Eismn.	hand.	s&l-2*.	Eismn*	
Winther 69	3		150	own.	rol-c.	s-flex.	sol.	36x6	36x5d	Clrk.	mt.	Wsc.	4-4 x6 -25.6	4	cent.	own.	cst.	Brem.	pln.	sing.	Eismn.	hand.	s&l-2*.	Bijur.	
Winther 979	3½		168	own.	rol-c.	s-flex.	pnu.	38x7	42x9	own.	mt.	Wsc.	4-4½x6 -32.4	4	cent.	own.	cst.	Brem.	pln.	sing.	Eismn.	hand.	s&l-2*.	Bijur.	
Winther 89	4		156	own.	rol-c.	s-flex.	sol.	36x5	40x5d	Clrk.	mt.	Wsc.	4-4¼x6 -29.0	4	cent.	own.	cst.	Brem.	pln.	sing.	Eismn.	hand.	s&l*.	Bijur.	

Gasoline Motor Trucks for 1920—Cont.

ENGINE									TRANSMISSION										BRAKES		CONTROL			UNIVERSALS		
GOVERNOR			SPEED		FUEL SYS.		CLUTCH		GEARSET				FINAL DRIVE								STEERING GEAR					
Type	Make	Drive	Motor in r.p.m.	Truck in m.p.h.	Carbureter Make	Fuel Feed	Type	Make	Type	Make	Placed	Speeds	Type	Rear Axle Make	Total Gear Reduction	Propulsion Taken By	Torque Taken By	Springs Make	Foot	Hand	Placed	Make	Levers	Type	Make	Name and Model
cent.	Pierce..	gset...	1180	12	Stmbg.	grv...	d-d...	B-Lipe.	selec...	B-Lipe.	amid..	4	worm.	Timkn.	11.66	r-rd...	sprgs..	Detr..	int-r-w..	int-r-w	l...	Ross.	ctr..	mtl..	Spicer..	Signal R
cent.	Pierce..	.....	.....	....	Zenith.	.....	.....	B-Beck.	.....	.....	.....	...	.....	Chic..	.....	.....	.....	.....	.....	.....	.....	.....	.....	mtl..	Spicer..	Southern A
cent.	Pierce..	.....	.....	....	Zenith.	.....	.....	B-Beck.	.....	.....	.....	...	.....	Chic..	.....	.....	sprgs..	.....	.....	.....	.....	Ross.	.....	mtl..	Spicer..	Southern B
suct..	Mnrch.	motor	1200	18	Stmbg.	grv...	d-d...	B-Lipe.	selec...	B-Lipe.	motr..	3	worm.	Timkn.	7.20	sprgs..	sprgs..	Stand.	int-r-w..	int-r-w	l...	Ross.	ctr..	mtl..	Spicer..	Standard 56
suct..	Mnrch.	motor	1200	15	Stmbg.	grv...	d-d...	B-Lipe.	selec...	B-Lipe.	amid..	4	worm.	Timkn.	7.75	r-rd...	.....	Stand.	int-r-w..	int-r-w	l...	Ross.	ctr..	mtl..	Spicer..	Standard 76
suct..	Mnrch.	motor	1100	12	Stmbg.	vac...	d-d...	B-Lipe.	selec...	B-Lipe.	amid..	4	worm.	Timkn.	10.33	r-rd...	.....	Stand.	int.-r-w.	int-r-w	l...	Gem.	ctr..	mtl..	Spicer..	Standard 66
suct..	Mnrch.	motor	1090	10	Stmbg	vac...	d-d...	B-Lipe.	selec...	B-Lipe.	amid..	4	worm.	Timkn.	13.66	r-rd...	sprgs..	Stand.	int-r-w.	int-r-w	l...	Gem.	ctr..	mtl..	Spicer..	Standard 86
cent.	Wau...	motor	1000	16	Rayfld.	vac...	d-d...	B-Lipe.	selec...	B-Lipe.	motr..	4	worm.	Timkn.	7.00	r-rd...	sprgs..	Mth..	int-r-w..	int-r-w	l...	Ross.	ctr..	mtl..	Spicer..	Sterling 1½
cent.	Wau...	motor	1000	16	Rayfld.	vac...	d-d...	B-Lipe.	selec...	B-Lipe.	motr..	4	worm.	Timkn.	7.70	r-rd...	sprgs.	Mth..	int-r-w..	nt-r-w	l...	Ross.	ctr..	mtl..	Spicer..	Sterling 2½
cent.	Wau...	motor	1000	13	Rayfld.	vac...	w-d...	M&E..	ind-c...	own...	amid..	3	worm.	Timkn.	8.75	r-rd...	sprgs.	Mth..	int-r-w..	int-r-w	l...	Ross.	ctr..	mtl..	Unvsl*	Sterling 3½
cent.	Wau...	motor	1000	13	Rayfld.	vac...	w-d...	M&E..	ind-c...	own...	amid..	3	worm.	Timkn.	8.80	r-rd...	sprgs.	Mth..	int-r-w..	int-r-w	l...	Ross.	ctr..	mtl..	Unvsl*	Sterling 5-W
cent.	Wau...	motor	1000	7	Rayfld.	vac...	w-d...	M&E..	ind-c...	own...	amid..	6	chn..	own...	7.04	r-rd...	.....	Mth..	int-r-w..	int-d-s	l...	Ross.	ctr..	mtl..	Unvsl.	Sterling 5-C
cent.	Wau...	motor	1000	8	Rayfld.	vac...	w-d...	M&E..	ind-c...	own...	amid..	6	chn..	own...	7.26	r-rd...	.....	Mth..	int-r-w..	int-d-s	l...	Ross.	ctr..	mtl..	Unvsl.	Sterling 7½
none.	none...	none..	1400	22	Zenith.	grv...	d-p...	B-Beck.	selec...	Dur....	motr..	3	int-g..	Clrk...	6.00	sprgs..	sprgs..	Detr..	ext-r-w..	ext-d-s	l...	CAS.	ctr..	mtl..	Hart...	Stewart 11
suct..	Mnrch.	motor	1200	20	Zenith.	grv...	d-p...	B-Beck.	selec...	Dur....	motr..	3	int-g..	Clrk...	6.80	sprgs..	sprgs..	Detr..	ext-r-w..	ext-d-s	l...	Gem.	ctr..	mtl..	Hart...	Stewart 8
suct..	Mnrch.	motor	1250	18	Zenith.	grv...	d-p...	Fuller..	selec...	Fuller..	motr..	3	int-g..	Clrk...	7.60	sprgs..	sprgs..	Detr..	ext-r-w..	ext-d-s	l...	Gem.	ctr..	mtl..	Hart...	Stewart 9
cent.	Pierce..	motor	1100	14	Zenith.	grv...	d-p...	Fuller..	selec...	Fuller..	motr..	3	int-g..	Clrk...	9.00	sprgs..	sprgs..	Detr*	ext-r-w..	ext-d-s	l...	Ross.	ctr..	mtl..	Hart...	Stewart 7
cent.	Pierce..	motor	1120	12	Zenith.	grv...	d-p...	Fuller..	selec...	Fuller..	motr..	4	int-g..	Clrk...	10.00	sprgs..	sprgs..	Iron..	ext-r-w..	ext-d-s	l...	Ross.	ctr..	mtl..	Hart...	Stewart 10
none.	none...	none..	.....	....	Stmbg.	grv...	cone...	.....	selec...	Covert.	amid..	3	worm.	Timkn.	8.50	sprgs..	sprgs..	Merl..	int-r-w..	int-r-w	l...	Ross.	ctr..	mtl..	Hart...	Sullivan F
none.	none...	none..	.....	....	Stmbg.	vac...	d-d...	B-Lipe.	selec...	B-Lipe.	motr..	3	worm.	Timkn.	7.75	sprgs..	sprgs..	Shel..	int-r-w..	int-r-w	l...	Ross.	ctr..	mtl..	Spicer..	Sullivan E
none.	none...	none..	.....	....	Stmbg.	vac...	d-d...	B-Lipe.	selec...	B-Lipe.	amid..	4	worm.	Timkn.	10.33	r-rd...	sprgs..	Shel..	int-r-w..	int-r-w	l...	Ross.	ctr..	mtl..	Spicer..	Sullivan H
cent.	Pierce..	motor	1000	13½	Schblr..	grv...	d-d...	Fuller..	selec...	Fuller..	motr..	3	worm.	Shel...	7.75	r-rd...	sprgs..	Kal...	int-r-w..	int-r-w	l...	Ross.	ctr..	mtl..	Pet....	Tiffin GW
cent.	Pierce..	motor	1000	12	Schblr..	grv...	d-d...	Fuller..	selec...	Fuller..	motr..	4	worm.	Shel...	8.70	r-rd...	sprgs..	Kal...	int-r-w..	int-r-w	l...	Ross.	ctr..	mtl..	Pet....	Tiffin MW
cent.	Pierce..	motor	1000	12	Schblr..	grv...	d-p...	B-Beck.	selec...	Fuller..	amid..	4	worm.	Shel...	8.70	r-rd...	sprgs..	Kal...	int-r-w..	int-r-w	l...	Ross.	ctr..	mtl..	Pet....	Tiffin PW
cent.	Pierce..	motor	1000	10	Schblr..	grv...	d-p...	B-Beck.	selec...	Covert.	amid..	4	worm.	Shel...	11.75	r-rd...	sprgs..	Kal...	int-r-w..	int-r-w	l...	Ross.	ctr..	mtl..	Pet....	Tiffin TW
cent.	Pierce..	motor	1000	9	Schblr..	grv...	d-p...	B-Beck.	selec...	Covert.	amid..	4	worm.	Shel...	13.00	r-rd...	sprgs..	Kal...	int-r-w..	int-r-w	l...	Ross.	ctr..	mtl..	Pet....	Tiffin UW
cent.	Simp...	motor	1050	12	Stmbg.	grv...	d-p...	.....	ind-c...	Cotta..	amid..	4	int-g..	Clrk...	8.00	r-rd...	sprgs..	Shel...	int-r-w..	ext-d-s	l...	Lavn..	ctr..	mtl..	Unvsl..	Titan Transport
cent.	Simp...	motor	1050	12	Stmbg.	grv...	d-p...	.....	ind-c...	Cotta..	amid..	4	int-g..	Clrk...	11.00	r-rd...	sprgs..	Shel...	int-r-w..	est-d-s	l...	Lavn..	ctr..	mtl..	Unvsl..	Titan 5-Ton
none.	none...	none..	1300	16	Cart...	grv...	d-d...	Covert.	selec...	Covert.	motr..	3	int-g..	Russl..	8.20	sprgs..	sprgs..	Detr..	ext-r-w..	int-r-w	l...	Ditw..	ctr..	mtl*.	Unvsl..	Traffic C
.....	Simp...	.....	.....	....	Stmbg.	.....	.....	Fuller..	.....	Fuller..	.....	3	int-g..	Clrk...	.....	.....	.....	Detr..	.....	.....	.....	Jacox.	.....	fab..	Therm.	Transport 20
.....	Simp...	.....	.....	....	Stmbg.	.....	.....	Fuller..	.....	Fuller..	.....	3	int-g..	Clrk...	.....	.....	.....	Detr..	.....	.....	.....	Jacox.	.....	mtl..	Arvac..	Transport 30
.....	Dplx...	.....	.....	....	Stmbg.	.....	.....	Fuller..	.....	Fuller..	.....	4	int-g..	Clrk...	.....	.....	.....	Detr..	.....	.....	.....	Jacox.	.....	mtl..	Arvac..	Transport 50
cent.	Wau...	motor	1450	18	Stmbg.	grv...	d-d...	Fuller..	selec...	Fuller..	motr..	3	int-g..	Clrk...	6.80	sprgs..	sprgs..	Detr..	ext-d-s..	ext-r-w	l...	Gem..	ctr..	mtl..	Unvsl..	Triangle A
cent.	Pierce..	motor	1350	16	Stmbg.	grv...	d-d...	Fuller..	selec...	Fuller..	motr..	4	int-g..	Clrk...	8.00	sprgs..	sprgs..	Detr..	ext-d-s..	ext-r-w	l...	Gem..	ctr..	mtl..	Unvsl..	Triangle B
cent.	Dplx...	motor	1100	15	Schblr..	grv...	d-d...	Fuller..	selec...	Fuller..	motr..	4	int-g..	Russl..	7 80	sprgs..	sprgs..	Mth..	ext-r-w..	int-r-w	l...	Ross..	ctr..	mtl..	Univ ..	Union F
cent.	Dplx...	motor	1100	12	Schblr..	grv...	d-d...	Fuller..	selec...	Fuller..	motr..	4	int-g..	Torbn..	10.25	sprgs..	sprgs..	Mth..	ext-r-w..	ext-d-s	l...	Ross..	ctr..	mtl..	Univl..	Union H
cent.	Dplx...	motor	1000	16	Stmbg.	pres...	d-d...	Fuller..	selec...	.....	motr..	3	int-g..	Clrk...	7 00	sprgs..	sprgs..	.....	ext-r-w..	ext-r-w	l*	.....	ctr..	.....	.....	United A
cent.	Dplx...	motor	1000	14	Stmbg.	pres...	d-d...	Fuller..	selec...	.....	amid..	4	int-g..	Clrk...	8.15	sprgs..	sprgs..	.....	ext-r-w..	ext-r-w	l*	.....	ctr..	.....	.....	United B
cent.	Dplx...	motor	1000	12	Stmbg*	pres...	d-d...	Fuller..	selec...	.....	amid..	4	int-g..	Clrk...	10.00	sprgs..	sprgs..	.....	ext-r-w..	ext-r-w	l*	.....	ctr..	.....	.....	United C
cent.	Dplx...	motor	.....	10	Stmbg.	pres...	d-d...	Fuller..	selec...	.....	amid..	4	int-g..	Clrk...	12.50	sprgs..	sprgs..	.....	ext-r-w..	ext-r-w	l*	.....	ctr..	.....	.....	United V
suct..	Mnrch.	motor	1400	19.8	Stmbg.	vac...	d-d...	B-Lipe.	prog..	B-Lipe.	motr..	3	int-g..	Clrk...	7.60	sprgs..	sprgs..	Shel...	ext-r-w..	int-r-w	l...	Lavn..	ctr..	mtl..	Blood..	U. S N
cent.	Pierce..	motor	1160	14.2	Stmbg.	grv...	cone..	Hart...	prog..	B-Lipe.	amid..	4	worm.	Shel...	8.75	sprgs..	sprgs..	Shel...	int-r-w..	int-r-w	l...	Lavn..	ctr..	mtl..	Blood..	U. S H
cent.	Pierce..	motor	1090	11.0	Stmbg.	grv...	cone..	Hart...	prog..	B-Lipe.	amid..	4	worm.	Shel...	11.75	sprgs..	sprgs..	Shel...	int-r-w..	int-r-w	l...	Lavn..	ctr..	mtl..	Blood..	U. S J
cent.	Wau...	motor	950	12.9	Stmbg.	grv...	d-p...	B-Beck.	ind-c...	Cotta..	amid.	3	worm.	Shel...	8.70	r-rd...	sprgs..	Shel...	int-r-w..	int-r-w	l...	Lavn..	ctr..	mtl..	Blood..	U. S K
suct..	Mnrch.	motor	.....	18	Stmbg.	grv...	d-p...	B-Beck.	selec...	Dur....	motr..	3	int-g..	Torbn..	8.00	sprgs..	sprgs..	Mth..	ext-r-w..	int-r-w	l...	Gem..	ctr..	mtl..	Arvac..	Velie 46
cent.	Pierce..	motor	.....	14	Stmbg.	vac...	d-d...	B-Lipe.	selec...	B-Lipe.	amid..	4	worm.	Timkn.	10.30	r-rd...	sprgs..	Mth..	int-r-w..	int-r-w	l...	Gem..	ctr..	mtl..	Spicer..	Velie 26-B
none.	none...	none..	.....	....	Stmbg.	grv...	w-d...	Fuller..	prog..	Fuller..	motr..	3	int-g*.	Clrk...	7.00	sprgs..	.....	Tuth..	.....	int-r-w	l...	Ross.	ctr..	mtl..	Acme..	Victor A
none.	none...	none..	.....	....	Stmbg.	grv...	w-d...	Fuller..	prog..	Fuller..	motr..	3	int-g*.	Clrk...	7.00	sprgs.	.....	Tuth..	.....	int-r-w	l...	Ross.	ctr..	mtl..	Acme..	Victor B
none.	none...	none..	1200	25	Zenith.	grv...	cone..	own...	selec...	own...	motr..	3	worm.	Shel...	5.50	sprgs..	sprgs..	Shel...	int-r-w..	int-r-w	l...	Jacox.	ctr..	mtl..	Spicer..	Vim 27
none.	none...	none..	1200	25	Zenith.	grv...	cone..	own...	selec...	own...	motr..	3	worm.	Shel...	5.50	sprgs..	sprgs..	Shel...	int-r-w..	int-r-w	l...	Jacox.	ctr..	mtl..	Spicer..	Vim 28
none.	none...	none..	1600	30	Zenith.	grv...	d-d...	B-Lipe.	selec...	B-Lipe.	motr..	3	worm.	Shel...	6.50	sprgs..	sprgs..	Shel...	int-r-w..	int-r-w	l...	Jacox.	ctr..	mtl..	Spicer..	Vim 25
cent.	Dplx...	motor	1250	16	Zenith.	grv...	d-d...	B-Lipe.	selec...	B-Lipe.	motr..	4	worm.	Shel...	7.75	sprgs..	sprgs..	Shel...	int-r-w..	int-r-w	l...	Gem..	ctr..	mtl..	Spicer..	Vim 22
cent.	Dplx...	motor	1100	14	Zenith.	grv...	d-d...	B-Lipe.	selec...	B-Lipe.	amid..	4	worm.	Shel...	7.75	sprgs..	sprgs..	Shel...	int-r-w..	int-r-w	l...	Gem..	ctr..	mtl..	Spicer..	Vim 23
cent.	Pierce..	motor	1600	16	Zenith.	grv...	d-d...	B-Lipe.	selec...	B-Lipe.	amid..	4	worm.	Timkn.	8.50	sprgs..	sprgs..	S-P...	int-r-w..	int-r-w	l...	Ross..	ctr..	mtl..	Spicer..	Walker-Johnson B
cent.	own...	motor	1200	15	Zenith.	grv...	cone..	own...	selec...	own...	motr..	4	ext-g..	own...	9.50	sprgs.	sprgs.	.....	ext-d-s.	ext-d-s	l...	own...	ctr..	fab.	own...	Waiter. Tractor M.O.-35
cent.	Wau...	motor	1100	14	Stmbg.	grv...	d-d...	B-Lipe.	selec...	Warn..	amid..	4	d-rd...	own...	10.00	sprgs..	sprgs..	S-P.	ext-d-s.	ext-r-w	l...	Ross.	ctr..	fab.	M&E.	Walter S
cent.	Wau ..	motor	1000	16	Zenith.	grv...	d-d...	B-Lipe.	selec...	B-Lipe.	amid..	4	worm.	Shel...	7.75	r-rd...	sprgs..	Merl..	int-r-w..	int-r-w	l...	Ross.	ctr..	mtl..	Spicer..	Ward-La France 2B
cent.	Wau...	motor	900	14	Zenith.	grv...	d-d...	B-Lipe.	selec...	B-Lipe.	amid..	4	worm.	Shel...	8.75	r-rd...	sprgs..	Merl..	int-r-w..	int-r-w	l...	Ross.	ctr..	mtl..	Spicer..	Ward-La France 4A
cent.	Wau...	motor	900	12	Zenith.	grv...	d-d...	B-Lipe.	selec...	B-Lipe.	amid..	4	worm.	Shel...	10.25	r-rd...	sprgs..	Merl..	int-r-w..	int-r-w	l...	Ross.	ctr..	mtl..	Spicer..	Ward-La France 5A
cent.	Pierce..	motor	2000	16	Rayfld.	grv...	d-d...	B-Beck.	ind-c...	.....	jst....	3	bevl-4	own...	.....	t-arm.	t-arm.	.....	ext-d-s.	ext-r-w	r...	.....	r...	.....	.....	Ware A-3½
cent.	Pierce..	motor	1100	11	Stmbg.	grv...	d-d...	B-Lipe.	selec...	B-Lipe.	amid..	4	worm.	Timkn.	8.75	sprgs.	sprgs.	Shel...	int-r-w..	int-r-w	l...	Gem..	ctr..	mtl*.	Spicer..	Watson 3½
none.	none...	none.	1400	....	own...	grv...	w-p...	own...	selec...	own...	amid.	4	bevel..	own...	.....	r-rd...	sprgs.	.....	ext-r-w.	int-r-w	l...	own...	ctr..	mtl..	own...	White 15
none.	none...	none.	1400	....	own...	grv...	w-p...	own...	selec...	own...	amid.	4	d-rd...	own...	.....	r-rd...	sprgs.	.....	ext-r-w.	int-r-w	l...	own...	ctr..	mtl..	own...	White 30
cent.	own...	motor	1600	15	own...	vac...	w-p...	own...	selec...	own...	motr..	4	d-rd...	own...	.....	r-rd...	sprgs.	.....	ext-d-s.	int-r-w	l...	own...	ctr..	mtl..	own...	White 40
cent.	own...	motor	1600	15	own...	vac...	w-p...	own...	selec...	own...	motr..	4	d-rd...	own...	.....	r-rd...	sprgs.	.....	ext-d-s.	int-r-w	l...	own...	ctr..	mtl..	own...	White 45
.....	.....	.....	.....	....	Stmbg.	.....	cone...	.....	.....	Covert.	.....	3	worm.	Shel...	.....	.....	.....	.....	.....	.....	.....	Ross.	.....	.....	own...	Wichita L
.....	Wau...	.....	.....	....	Stmbg.	.....	cone...	.....	.....	Covert.	.....	3	worm.	Shel...	.....	.....	.....	.....	.....	.....	.....	Ross.	.....	.....	own...	Wichita M
.....	Wau...	.....	.....	....	Stmbg.	.....	cone...	.....	.....	Covert.	.....	3	worm.	Shel...	.....	.....	.....	.....	.....	.....	.....	Ross.	.....	.....	own...	Wichita R
.....	Wau...	.....	.....	....	Stmbg.	.....	cone...	.....	.....	B-Lipe.	.....	4	worm.	Shel...	.....	.....	.....	.....	.....	.....	.....	Ross.	.....	.....	own...	Wichita O
.....	Dplx...	.....	.....	....	Stmbg.	.....	cone...	.....	.....	own...	.....	4	d-rd...	own...	.....	.....	.....	.....	.....	.....	.....	Ross.	.....	.....	own...	Wichita S
cent.	Pierce..	motor	1100	18	Stmbg.	grv...	d-d...	B-Lipe.	selec...	B-Lipe.	motr..	3	worm.	Wis....	7.75	sprgs..	sprgs..	Shel*	int-r-w..	int-r-w	l...	Gem..	ctr..	mtl..	Spicer..	Wilcox A-1
cent.	Pierce..	motor	1100	14	Wil-B..	grv...	cone..	own...	selec...	own...	amid..	4	worm.	Wis....	8.25	sprgs..	sprgs..	Shel*	int-r-w..	int-r-w	l...	own...	ctr..	mtl*	Hart*.	Wilcox B
cent.	Pierce..	motor	1100	13	Wil-B..	grv...	cone..	own...	selec...	own...	amid..	4	worm.	Wis....	8.60	sprgs..	sprgs..	Shel*	int-r-w..	int-r-w	l...	own...	ctr..	mtl*	Hart*.	Wilcox C
cent.	Pierce..	motor	1100	12	Wil-B..	grv...	cone..	own...	selec...	own...	amid..	4	worm.	Shel...	11.75	r-rd...	sprgs.	Shel...	int-r-w..	int-r-w	l...	own...	ctr..	mtl*	Hart*.	Wilcox E
cent.	Wau..	motor	1000	12	Wil-B..	grv...	cone..	own...	selec...	own...	amid..	4	worm.	Shel...	10.25	r-rd...	sprgs.	Shel...	int-r-w..	int-r-w	l...	own...	ctr..	mtl	Hart*.	Wilcox W
cent.	Pierce..	motor	1100	17	Marvl..	grv...	d-d...	B-Beck.	selec...	B-Lipe.	amid..	4	worm.	Timkn.	6.00	sprgs.	sprgs.	S-P...	int-r-w..	int-r-w	l...	Ross.	ctr..	mtl*	Hart*.	Wilson F
cent.	Pierce..	motor	1150	15	Marvl..	grv...	d-d...	B-Beck.	selec...	B-Lipe.	amid..	4	worm.	Timkn.	7.75	sprgs.	sprgs.	S-P...	int-r-w..	int-r-w	l...	Ross.	ctr..	mtl*	Hart*.	Wilson EA
cent.	Pierce..	motor	1150	14	Marvl..	grv...	d-d...	B-Lipe.	selec...	B-Beck.	amid..	4	worm.	Timkn.	8.75	sprgs.	sprgs.	S-P...	int-r-w..	int-r-w	l...	Ross.	ctr..	mtl*	Hart*.	Wilson G
cent.	Pierce..	motor	1100	12	Marvl..	grv...	d-d...	B-Lipe.	selec...	B-Beck.	amid..	4	worm.	Timkn.	10.25	sprgs.	sprgs.	S-P...	int-r-w..	int-r-w	l...	Ross.	ctr..	mtl*	Hart*.	Wilson H
none.	none...	none..	1600	17	Stmbg.	grv...	d-d...	Fuller..	selec...	Fuller..	motr..	3	int-g-4	Ken...	9.00	sprgs..	sprgs.	Harv..	ext-d-s.	ext-d-s	l...	Lavn.	ctr..	mtl..	Arvac..	Winther-Marwin 439-A
none.	none...	none..	1500	16	Stmbg.	grv...	d-d...	Fuller..	selec...	Fuller..	motr..	3	int-g-4	Clrk...	10.50	sprgs..	sprgs.	Harv..	ext-r-w.	ext-d-s	l...	Lavn.	ctr..	mtl..	Arvac..	Winther-Marwin 459
none.	none...	none..	1400	15	Mast...	vac...	d-p...	B-Beck.	selec...	B-Lipe.	amid..	4	int-g-4	Clrk...	.....	sprgs.	sprgs.	Mth..	ext-r-w..	int-r-w	r...	Ross.	ctr..	mtl..	Blood..	Winther-Marwin 479
none.	none...	none..	1400	20	Stmbg.	grv...	d-d...	Fuller..	selec...	Fuller..	motr..	3	int-g..	Ken...	7.00	sprgs..	sprgs.	Harv..	ext-d-s.	ext-d-s	l...	Lavn.	ctr..	mtl..	Arvac..	Winther 39
none.	none...	none..	1400	13	Mast...	vac...	d-p...	B-Beck.	selec...	B-Lipe.	amid..	4	int-g..	Clrk...	8.13	sprgs..	sprgs.	Mth..	ext-r-w..	int-r-w	r...	Ross.	ctr..	mtl..	Blood..	Winther 49A
none.	none...	none..	1400	17	Mast...	vac...	d-p...	B-Beck.	selec...	B-Lipe.	amid..	4	int-g..	Clrk...	9.00	sprgs..	sprgs.	Mth..	ext-r-w..	int-r-w	r...	Ross.	ctr..	mtl..	Blood..	Winther 69
none.	none...	none..	1400	25	Mast...	vac...	d-p...	B-Beck.	selec...	B-Lipe.	amid..	4	int-g..	Clrk...	7.00	sprgs..	sprgs.	Mth.	ext-r-w..	int-r-w	r...	Ross.	ctr..	mtl..	Blood..	Winther 979
cent.	Dplx...	motor	1295	14	Mast...	vac...	d-p...	B-Beck.	selec...	B-Lipe.	amid..	4	int-g..	Clrk...	.....	sprgs..	sprgs.	Mth.	int-r-w..	int-r-w	r...	Ross.	ctr..	mtl..	Blood..	Winther 89

Detailed Technical Specifications of

Name and Model	Tons Capacity	Chassis Price	Wheelbase, Inches	FRAME: Make	FRAME: Materia	FRAME: Type	TIRES: Kind	TIRES: Size in Ins. Front	TIRES: Size in Ins. Rear	WHEELS: Make	WHEELS: Type	ENGINE: Make	ENGINE: No. Cyl. Bore and Stroke—N.A.C.C. Hp.	ENGINE: Cylinders Cast	COOLING: Water Circ.	COOLING: Radiator CASE Make	COOLING: Radiator CASE Type	COOLING: Radiator CORE Make	COOLING: Radiator CORE Type	IGNITION: Type	IGNITION: Make	IGNITION: Spark Advance	ELEC. SYSTEM: Type	ELEC. SYSTEM: Make	ELEC. SYSTEM: Extra Cost $
Winther 109	5	.....	162	own...	rol-c..	s-flex..	sol....	36x5	40x5d	Clrk..	mt....	Wsc...	4-4½x5½-36.2	2	cent...	own...	cst.....	Brem.	pln....	sing...	Eismn.	hand..	lghtg..	Bijur..	....
Winther 129	6	.....	162	own...	rol-c..	s-flex..	sol....	36x6	40x6d	Clrk..	mt....	Wsc...	4-5½x6 -42.2	4	cent...	own...	cst.....	Brem.	pln....	sing...	Eismn.	hand..	lghtg..	Bijur..	....
Winther 149	7	.....	162	own...	rol-c..	s-flex..	sol....	36x6	40x7d	Clrk..	mt....	Wsc...	4-5½x6 -42.2	2	cent...	own...	cst.....	Brem.	pln....	sing...	Eismn.	hand..	lghtg..	Bijur..	....
Witt-Will N	1	2,000	120	Prsh..	p-stl..	flex...	sol....	36x3½	36x4	Arch..	wd....	Con...	4-3½x5 -22.5	4	cent...	Brem.	cst.....	Brem.	cel.....	sing...	Eismn.	auto..	none..	none..	none
Witt-Will. N. Special	1½	2,150	120	Prsh..	p-stl..	flex...	sol....	36x3½	36x5	Arch..	wd....	Con...	4-3½x5 -22.5	4	cent...	Brem.	cst.....	Brem.	cel.....	sing...	Eismn.	auto..	none..	none..	none
Witt-Will P	2½	2,950	144	Prsh..	p-stl..	flex...	sol....	36x3½	36x7	Arch..	wd....	Con...	4-4½x5½-27.2	4	cent...	Mod..	cst.....	Mod..	cel.....	sing...	Eismn.	auto..	none..	none..	none
Wolverine C	1½	.....	140	P&B..	p-stl..	s-flex..	sol*...	34x3½	34x5	.....	wd....	Con...	4-3½x5 -22.5	4	ther...	Lng...	cst.....	Lng...	fin.....	sing...	Eismn.	hand..	sl&i-2.	G&D..	non.

Received Too Late to Classify

Acme F	1½	$2,275	141	Smith.	p-stl..	s-flex..	sol....	34x3½	34x5	Bim...	wd....	own...	4-3½x5 -22.5	4	ther...	G&O..	sht.....	G&O..	fin.....	sing...	Eismn	hand..	lghtg..	G&D..	30
Atco IG-10	1	.....	132	own...	rol-c..	rigid..	pnu...	34x4½	36x6	Stn...	wd....	.....	4-3½x5½-22.5	4	cent...	Chgo..	cst.....	Chgo..	fin.....	sing...	.....	hand..	s,l&i..	West..	....
Beck K	3½	3,700	160	P&B..	p-stl..	.....	sol....	36x5	36x5d	.....	wd....	Con...	4-4½x5½	.....	.....	.....	.....	.....	tub.....	.....	Bosch	.....	.....	.....	.....
Bethlehem D	¾	1,495	125	Det..	p-stl..	.....	pnu...	34x4½	34x4½	Wyn..	wd....	own...	4-3½x5 -19.6	....	ther...	Liv...	sht.....	Liv...	cel.....	sing...	Bosch.	hand..	lghtg..	G&D..	....
Chevrolet 1		1,325	125	own...	rol-c..	.....	pnu...	33x4	35x5	own...	wd....	own...	4-3⅛x5½	4	cent...	own..	p-stl....	own..	cel.....	sing...	A-L..	hand..	st&lg..	A-L..	....
Chevrolet	¾	.....	110	.....	.....	.....	pnu...	33x4	33x4	.....	wd....	own...	4-3⅛x5½	4	cent...	own..	p-stl....	own..	cel.....	dual..	Remy.	hand..	st&lg..	.....	....
Columbia H	1½	2,200	138	.....	ch-stl..	.....	sol....	34x3½	34x5	.....	.....	Hink..	4-3½x5½	....	.....	.....	.....	.....	.....	.....	Bosch.	.....	.....	.....	....
Dart H	1	2,100	130	Sav...	p-stl..	s-flex..	sol....	34x3½	34x5	Bim...	wd....	Buda..	4-3½x5½-22.5	4	ther...	own...	cast.....	S-J..	cel.....	sing...	Eismn	hand..	s-l*	.....	200
Dart S	1½	2,250	140	Sav...	p-stl..	s-flex..	sol....	34x3½	34x6	Bim...	wd....	Buda..	4-3½x5½-22.5	4	ther...	own...	cast.....	S-J..	cel.....	sing...	Eismn	hand..	s-l*	.....	200
Dart M	2½	3,000	150	Sav...	p-stl..	s-flex..	sol....	36x4	36x7	Bim...	wd....	Buda..	4-4½x5½-29.0	4	cent...	own...	cast.....	S-J..	cel.....	sing...	Eismn	hand..	s-l*	.....	200
Dart W	3½	4,000	160	Sav...	ro-st..	rigid..	sol....	36x5	36x10	Bim...	wd....	Buda..	4-4½x6 -32.4	4	cent...	own...	cast.....	S-J..	cel.....	sing...	Eismn	hand..	s-l*	.....	200
Dearborn 48	2	2,390	148	own...	rol-st..	s-flex..	pnu*	34x4½	34x7	.....	wd....	Buda..	4-3½x5½-22.5	4	ther...	Chgo.	cast.....	Chgo.	fin.....	sing...	Bosch	hand..	.....	.....	....
Denby 27	4	4,150	170	Drt...	p-stl..	s-flex..	sol..	36x5	36x10	.....	mt....	Cont..	4-4½x5½-32.4	2	cent...	Lng...	cast.....	Lng...	pln.....	sing...	Eismn	hand..	.....	.....	....
Dod e	¾	.....	114	.....	.....	.....	pnu...	32x3½	32x3½	.....	wd....	own...	4-3½x4½	4	cent...	.....	.....	.....	cel.....	sing...	own..	hand..	st&lg..	N.E..	....
Douglas D	1½	2,000	128	own...	rol-c..	.....	sol....	34x3½	34x5	own...	wd....	Buda..	4-4½x5½	4	cent...	own...	cast.....	.....	.....	sing...	Eismn	hand..	.....	.....	....
Famous B12	1½	2,095	138	.....	p-stl	.....	sol....	36x3½	36x5	.....	.....	Cont..	4-3¾x5- 22.5	4	ther...	.....	cast.....	.....	tube....	"GS"	Eismn	hand..	.....	.....	....
Gramm-Bernstein 65	1½	.....	138	Hyd...	p-stl..	flex...	opt...	36x3½	36x5	Bim...	wd....	Cont..	4-3¾x5	4	ther...	own...	cast.....	Lng...	fin.....	sing...	N.E..	hand..	st-l...	N.E..	....
Gramm-Bernstein 15	1½	.....	138	Hyd...	p-stl..	flex...	sol....	36x3½	36x5	Bim...	wd....	Cont..	4-3¾x5 -22.5	4	ther...	own...	cast.....	Lng...	fin.....	sing...	N.E..	hand..	s-l.....	N.E..	....
Gramm-Bernstein 20	2	.....	144	Hyd...	p-stl..	flex...	sol....	36x4	36x7	Bim...	wd....	Cont..	4-4½x5½-27.2	4	cent...	own...	cast.....	Lng...	fin.....	sing...	N.E..	hand..	s-l.....	N.E..	....
Gramm-Bernstein 35	3½	.....	156	Hyd...	p-stl..	flex...	opt...	36x5	40x10	Sth...	mtl...	Hink..	4-4 x4½	4	cent...	own...	cast.....	Lng...	fin.....	dual..	Eismn	hand..	s-l-i...	N.E..	....
Gramm-Bernstein 50	5	.....	168	Hyd...	p-stl..	flex...	sol....	36x6	40x12	Sth...	mtl...	Cont..	4-4¼x6	2	cent...	own...	cast.....	Lng...	fin.....	dual..	Eismn	hand..	l.....	N.E..	....
Independent F	1-2	.....	140	.....	.....	.....	.....	36x3½	36x5	.....	.....	Cont..	4-3¾x5 -22.5	....	cent...	.....	cast.....	.....	.....	.....	Eismn	.....	.....	.....	....
Jumbo 15	1½	2,595	144½	.....	p-stl..	s-flex..	sol....	36x3½	36x5	.....	wd....	Buda..	4-3¾x5½-22.5	4	cent...	.....	cst.....	.....	pln.....	sing...	N-E..	hand..	s&l.....	.....	none
Jumbo 20	2	2,795	144½	.....	p-stl..	s-flex..	pnu...	35x5	38x7	.....	wd....	Buda..	4-3¾x5½-22.5	4	cent...	.....	cst.....	.....	pln.....	sing...	N-E..	hand..	s&l.....	.....	none
Jumbo 25	2½	3,095	152½	.....	p-stl..	s-flex..	sol....	36x4	36x7	Day..	mt....	Buda..	4-4½x5½-29.0	4	cent...	.....	cst.....	.....	pln.....	sing...	Eismn	hand..	lghtg..	.....	none
Jumbo 30	3	3,590	152½	.....	p-stl..	s-flex..	pnu...	36x6	42x9	Clk..	mt....	Buda..	4-4½x5½-29.0	4	cent...	.....	cst.....	.....	pln.....	sing...	Eismn	hand..	lghtg..	.....	none
Jumbo 5	3½	4,300	165	.....	p-stl..	s-flex..	sol....	36x5	36x10	Day..	mt....	Buda..	4-4½x6 -32.4	4	cent...	.....	cst.....	.....	pln.....	sing...	Eismn	hand..	lghtg..	.....	none
Jumbo 40	4	4,875	165	.....	p-stl..	s-flex..	pnu...	38x7	44x10	Clk..	mt....	Buda..	4-4½x6 -32.4	4	cent...	.....	cst.....	.....	pln.....	sing...	Eismn	hand..	lghtg..	.....	none
Oneida A9	1½	1,985	135	.....	p-stl	.....	sol....	36x3½	36x5	Prud..	wd....	own...	4-3¾x5½-22.5	....	cent...	own...	cast.....	Spix..	cel.....	.....	Bosch.	.....	stl.....	West..	....
Oneida B9	1½	2,385	144	.....	p-stl	.....	sol....	36x3½	36x6	Prud..	wd....	own...	4-4 x5½-25.6	....	cent...	own...	cast.....	Spix..	cel.....	.....	Bosch.	.....	stl.....	West..	....
Oneida C9	2½	2,900	160	.....	p-stl..	.....	sol....	36x4	36x7	Prud..	wd....	own...	4-4 x5½-25.6	....	cent...	own...	cast.....	Spix..	cel.....	.....	Bosch.	.....	stl.....	West..	....
Oneida D9	3½	3,800	170	.....	p-stl	.....	sol....	36x5	36x5d	Sth...	mtl...	own...	4-4½x5½-32.4	....	cent...	own...	cast.....	Spix..	cel.....	.....	Bosch.	.....	stl.....	West..	....
Oneida E9	5	4,850	180	.....	p-stl	.....	sol....	36x6	40x12	Sth...	mtl...	own...	4-4½x5½-32.4	....	cent...	own...	cast.....	Spix..	cel.....	.....	Bosch.	.....	stl.....	West..	....
Patriot Lincoln	1½	.....	140	Det..	p-stl..	rigid..	sol*...	34x3½	34x5	Bim...	wd....	Hink..	4-4 x5½	4	cent...	own...	cast.....	Brem.	fin.....	sing...	Spltf.	hand..	.....	.....	....
Patriot Washington	2½	.....	156	Det..	p-stl..	rigid..	sol*...	36x4	36x7	Bim...	wd....	Hink..	4-4½x5½	4	cent...	own...	cast.....	Brem.	fin.....	sing...	Spltf.	hand..	.....	.....	....
Reynolds	1½	2,650	140	own...	ch-st..	flex...	sol....	36x3½	36x6	Sth...	mtl...	own...	4-4 x5½	2	cent...	own...	cast.....	own...	fin.....	sing...	Eismn	hand.	st&lg..	.....	....
Reynolds	2½	3,350	152	own...	ch-st..	flex...	sol....	36x4	36x8	Sth...	mtl...	own...	4-4½x5½	2	cent...	own...	cast.....	own...	fin.....	sing...	Eismn	hand.	st&lg..	.....	....
Reynolds	3½	4,350	165	own...	ch-st..	flex...	sol....	36x5	36x5	Sth...	mtl...	own...	4-4½x5½	2	cent...	own...	cast.....	own...	fin.....	sing...	Eismn	hand.	st&lg..	.....	....
Reynolds	5	5,350	165	own...	ch-st..	flex...	sol....	36x6	36x6d	Sth...	mtl...	own...	4-4½x5½	2	cent...	own...	cast.....	own...	fin.....	sing...	Eismn	hand.	st&lg..	.....	....
Service 71	3½	4,085	171	own...	p-stl..	flex...	sol....	36x5	36x5d	Bim...	wd....	Buda..	4-4½x5½-29.0	4	cent...	Lng...	cst.....	Lng...	fin.....	sing...	Eismn	hand.	st&lg2	West..	....
Triangle AA	¾	1,550	115	Mas..	rol-c..	s-flex..	pnu...	35x5	35x5	Hay..	wd....	H-S..	4-3½x5 -16.5	4	th-s..	Perf...	p-stl....	Perf..	tube....	sing...	Eismn	fixed.	st&lg..	N-E..	....
Triangle C	2	2,585	147	Mas..	rol-c..	s-flex..	sol....	36x4	36x6	Royer.	wd....	Wav..	4-3½x5½-22.5	2	cent...	Perf...	p-stl....	Perf..	tube....	sing...	Eismn	fixed.	.....	.....	....
Watson	¾	1,750	128	Prsh..	p-stl..	rigid..	pnu...	34x4½	34x4½	.....	wd....	Wau..	4-3¾x5½-22.5	4	cent...	G&O..	prs.....	G&O.	zz-t....	sing...	Dneto	hand.	sl&i-2.	Dneto	none
Wolverine D	2	.....	140	Pnb..	p-stl..	s-flex..	sol*...	34x4	34x3½d	.....	wd....	Cont..	4-3¾x5 -22.5	4	ther...	Lng...	cst.....	Lng...	fin.....	sing...	Eismn	hand.	sl&i-2.	G&D..	....

Steam Trucks

Name and Model	Capacity in Pounds	Price of Chassis	Wheelbase in Inches	FRAME: Material	FRAME: Construction	TIRES: Kind	TIRES: SIZE IN INCHES Front	TIRES: SIZE IN INCHES Rear	Wheels	BOILER: Location	BOILER: Type	BOILER: Heating Surface in Sq. In.	BOILER: Horsepower	BOILER: BURNER Type	BOILER: BURNER Regulation	BOILER: PRESSURE Normal in Lbs.	BOILER: PRESSURE Maximum in Lbs.	WATER: Water Capacity in Gal.	WATER: CONDENSER Type	WATER: CONDENSER Circulation
Steam-O-Truck	10,000	5,000	157	I-beam	.....	solid..	36x6	40x6d	p-st	under hood	Wat-tube	.....	40	atomiz..	auto....	.....	600	40	flat....	natural

Gasoline Motor Trucks for 1920—Cont.

ENGINE									TRANSMISSION										BRAKES		CONTROL			UNIVERSALS		
GOVERNOR			SPEED		FUEL SYS.		CLUTCH		GEARSET				FINAL DRIVE					Springs Make			STEERING GEAR					Name and Model
Type	Make	Drive	Motor in r.p.m.	Truck in m.p.h.	Carbureter Make	Fuel Feed	Type	Make	Type	Make	Placed	Speeds	Type	Rear Axle Make	Total Gear Reduction	Propulsion Taken By	Torque Taken By		Foot	Hand	Placed	Make	Levers	Type	Make	
cent.	Dplx...	motor	1100	12	Mast...	vac...	d-p...	B-Beck.	selec...	B-Lipe.	amid..	4	int-g..	Clrk...	.....	sprgs..	sprgs..	Mth.	int-r-w.	int-r-w	r.....	Ross..	ctr..	mtl..	Blood..	Winther.....109
cent.	Dplx...	motor	1016	11	Mast...	vac...	d-p...	B-Beck.	selec...	B-Lipe.	amid..	4	int-g..	Clrk...	.....	sprgs..	sprgs..	Mth.	int-r-w.	int-r-w	r.....	Ross..	ctr..	mtl..	Blood..	Winther.....129
cent.	Dplx...	motor	925	10	Mast...	vac...	d-p...	B-Beck.	selec...	B-Lipe.	amid..	4	int-g..	Clrk...	.....	sprgs..	sprgs..	Mth.	int-r-w.	int-r-w	r.....	Ross..	ctr..	mtl..	Blood..	Winther.....149
cent.	Pierce..	motor	1500	30	Zenith.	grv...	d-d...	B-Lipe.	selec...	B-Lipe.	motr..	3	worm.	Timkn.	6.75	sprgs..	sprgs..	Del..	int-r-w.	int-r-w	l.....	Ross..	l....	mtl..	Spicer..	Witt-Will.....N
cent.	Pierce..	motor	1500	30	Zenith.	grv...	d-d...	B-Lipe.	selec...	B-Lipe.	motr..	3	worm.	Timkn.	6.75	sprgs..	sprgs..	Del..	int-r-w.	int-r-w	l.....	Ross..	l....	mtl..	Spicer..	Witt-Will.....N. Special
cent.	Pierce..	motor	1500	25	Zenith.	grv...	d-d...	B-Lipe.	selec...	B-Lipe.	motr..	3	worm.	Timkn.	7.75	sprgs..	sprgs..	Del..	int-r-w.	int-r-w	l.....	Ross..	l....	mtl..	Spicer..	Witt-Will.....P
suct..	Mnrch.	motor	1350	17	Stmbg.	grv...	d-d...	Fuller..	selec...	Fuller..	motr..	3	int-g..	Russl..	7.70	sprgs.	.....	Tuth..	ext-r-w.	int-r-w	l.....	Gem..	ctr.	mtl..	Univ..	Wolverine.....C

Received Too Late to Classify

cent.	Dplx...	gearst.	1700	19½	Rayfld.	vac...	d-p...	B-Beck.	ind-c...	Cotta..	motr..	3	worm	Timkn.	8.75	sprgs..	sprgs..	Dtr..	int-r-w.	int-r-w.	l....	Ross..	ctr..	mtl..	Blood..	Acme.....F
none.	.....	.....	.....	.....	Stmbg	vac...	d-d...	Fuller..	selec...	Fuller..	motr..	3	int-g..	Torbn..	7.00	sprgs..	sprgs..	Shel..	ext-r-w.	int-r-w.	l....	Ross..	ctr..	mtl..	Hart...	Atco.....IG-10
.....	.....	.....	.....	.....	Stmbg	.....	d-d...	.....	selec...	.....	motr..	.....	.....	Shel..	.....	.....	.....	.....	ext-r-w.	int-r-w.	.....	Lavn..	.....	.....	.....	Beck.....D
.....	.....	.....	1480	25	Stmbg	grv...	d-p...	B&B...	selec...	Det...	motr..	3	s-b...	Stan...	6.00	sprgs..	sprgs..	Math.	ext-r-w.	int-r-w.	l....	Ross..	ctr..	mtl..	Spicer.	Bethlehem.....K
yes.	.....	.....	.....	26	Zenith	grv...	cone...	own...	selec...	own...	motr..	3	worm.	own...	.....	.....	.....	.....	int-r-w.	int-r-w.	l....	own...	ctr..	fab..	own...	Chevrolet.....
none.	none...	.....	.....	.....	Zenith	vac...	cone...	own...	selec...	own...	motr..	3	s-b...	own...	.....	.....	.....	.....	ext-r-w.	int-r-w.	l....	own...	ctr..	fab..	own...	Chevrolet.....
.....	Hink...	.....	.....	16	Stmbg	vac...	d-d...	Det...	selec...	Cov...	.....	.....	int-g..	Russ...	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	Spicer.	Columbia.....H
.....	.....	.....	.....	25	Zenith	vac...	d-d...	Fuller..	selec...	Fuller..	motr..	3	worm.	own...	7.00	sprgs..	sprgs..	Stan.	int-t....	int-r-w.	l....	Ross..	ctr..	mtl..	Spicer.	Dart.....H
00	.....	.....	.....	20	Zenith	vac...	d-d...	Fuller..	selec...	Fuller..	motr..	3	worm.	own...	7.00	sprgs..	sprgs..	Stan.	int-t....	int-r-w.	l....	Ross..	ctr..	mtl..	Spicer.	Dart.....S
00	cent	Pierce..	motr..	1200	18	Zenith	grv...	d-d...	Fuller..	selec...	Fuller..	motr..	4	worm.	own...	8.50	sprgs..	sprgs..	Stan.	int-t....	int-r-w.	l....	Ross..	ctr..	mtl..	Spicer.	Dart.....M
00	cent	Pierce..	motr..	1200	10	Zenith	grv...	d-d...	Fuller..	selec...	Fuller..	amid..	4	worm.	own...	10.30	sprgs..	sprgs..	Stan.	int-r-w.	int-r-w.	l....	Ross..	ctr..	mtl..	Spicer.	Dart.....W
00	cent	Simp..	motr..	1300	18	Stmbg	vac...	d-d...	Fuller..	selec...	Fuller..	motr..	3	worm.	Chic...	9.25	sprgs..	sprgs..	Dtr..	int-r-w.	int-r-w.	l....	Detw.	ctr..	mtl..	Hart...	Dearborn.....48
	cent	Simp..	motr..	1050	12	Stmbg	grv...	d-d...	own...	selec...	Warn..	amid..	4	int-g..	Clrk...	10.00	sprgs..	sprgs..	Dtr..	ext-r-w.	int-r-w.	l....	Ross..	ctr..	mtl..	Peters.	Denby.....27
	none.	none...	.....	.....	.....	Stew...	vac...	d-d...	own...	selec...	own...	motr..	3	s-b...	own...	4.10	sprgs..	t-t....	.....	ext-r-w.	int-r-w.	l....	own...	ctr..	.....	.....	Dodge.....
	cent	Pierce..	motr..	1600	16	Schblr..	vac...	d-d...	Fuller..	selec...	Fuller..	motr..	3	int-g..	Torbn..	.....	sprgs..	sprgs..	own...	int-r-w.	int-r-w.	l....	Ross..	.....	mtl..	Arvac..	Douglas.....D
	suct.	Mnrch.	motr.	.....	.....	Stmbg	grv...	d-d...	Fuller..	selec...	Fuller..	motr..	3	int-g..	Clrk...	7.00	sprgs..	sprgs..	.....	ext-d-s.	ext-r-w.	l....	Ross..	ctr..	mtl..	.....	Famous.....B12
	.....	.....	.....	1500	22	Stmbg	grv...	d-d...	Fuller..	ind-c...	Fuller..	amid..	3	worm.	Stan...	.....	sprgs..	sprgs..	Stan.	int-r-w.	int-r-w.	l....	Ross..	ctr..	fab..	Snead.	Gramm-Bernstein....65
	.....	.....	.....	.....	.....	Stmbg	grv...	d-d...	Fuller..	selec...	Fuller..	motr..	3	int-g..	Clrk...	.....	sprgs..	sprgs..	Stan.	ext-r-w.	int-r-w.	l....	Ross..	ctr..	fab..	Snead.	Gramm-Bernstein....15
	cent	Pierce..	motr..	1350	18. 6	Stmbg	grv...	d-d...	Fuller..	ind-c...	own...	amid..	4	worm.	Shel...	.....	sprgs..	sprgs..	Stan.	int-r-w.	int-r-w.	l....	Ross..	ctr..	fab..	own...	Gramm-Bernstein....20
	cent	Hink..	motr..	1200	16. 5	Stmbg	vac...	d-d...	own...	ind-c...	own...	amid..	4	worm.	Stan...	.....	sprgs..	sprgs..	Stan.	int-r-w.	int-r-w.	l....	Ross..	ctr..	fab..	own...	Gramm-Bernstein....35
	.....	Cont...	motr..	.....	.....	Stmbg	vac...	d-d...	own...	ind-c...	own...	amid..	4	worm.	Stan...	.....	sprgs..	sprgs..	Stan.	int-r-w.	int-r-w.	l....	Ross..	ctr..	fab..	own...	Gramm-Bernstein....50
	cent	Pierce.	.....	.....	.....	Schblr..	grv...	d-d...	Fuller..	selec...	Fuller..	motr..	3	worm.	Wis...	8.25	.....	.....	.....	.....	.....	.....	Ross.	.....	.....	Sterl..	Independent.....F
	none	none..	.....	1500	.....	Zenith	grv...	d-d...	Fuller..	selec...	Fuller..	motr..	3	int-g..	Clrk...	1.10	sprgs..	sprgs..	S-P..	.....	.....	l....	Jacox	ctr..	.....	Arvac..	Jumbo.....15
	none	none..	.....	1500	.....	Zenith	grv...	d-d...	Fuller..	selec...	Fuller..	motr..	3	int-g..	Clrk...	1.10	sprgs..	sprgs..	S-P..	.....	.....	l....	Jacox	ctr..	.....	Arvac..	Jumbo.....20
	.....	Dplx...	.....	1250	.....	Zenith	grv...	d-d...	Fuller..	selec...	Fuller..	motr..	4	int-g..	Clrk...	1.10	sprgs..	sprgs..	Dtr..	.....	.....	l....	Jacox	ctr..	.....	Arvac..	Jumbo.....25
	.....	Dplx...	.....	1250	.....	Zenith	grv...	d-d...	Fuller..	selec...	Fuller..	motr..	4	int-g..	Clrk...	1.10	sprgs..	sprgs..	Dtr..	.....	.....	l....	Jacox	ctr..	.....	Arvac..	Jumbo.....30
	.....	Simp..	.....	1000	.....	Zenith	grv...	d-d...	B-Lipe.	selec...	B-Lipe.	motr..	4	int-g..	Clrk...	1.10	sprgs..	sprgs..	S-P..	.....	.....	l....	Jacox	ctr..	.....	Arvac..	Jumbo.....35
	.....	Simp..	.....	1000	.....	Zenith	grv...	d-d...	B-Lipe.	selec...	B-Lipe.	motr..	4	int-g..	Clrk...	1.10	sprgs..	sprgs..	S-P..	.....	.....	l....	Jacox	ctr..	.....	Arvac..	Jumbo.....40
	.....	own...	motr..	1480	20	Stmbg	vac...	d-d...	own...	selec...	own...	amid..	3	worm.	own...	.....	.....	.....	own...	.....	.....	.....	Ross.	.....	.....	Spicer.	Oneida.....A9
	.....	own...	motr..	1500	17	Stmbg	vac...	d-d...	own...	selec...	own...	amid..	3	worm.	own...	.....	.....	.....	own...	.....	.....	.....	Ross.	.....	.....	Spicer.	Oneida.....B9
	.....	own...	motr..	1450	16	Stmbg	vac...	d-d...	own...	selec...	own...	amid..	4	worm.	own...	.....	.....	.....	own...	.....	.....	.....	Ross.	.....	.....	Spicer.	Oneida.....C9
	.....	own...	motr..	1450	14	Stmbg	vac...	d-d...	own...	selec...	own...	amid..	4	worm.	own...	.....	.....	.....	own...	.....	.....	.....	Ross.	.....	.....	Spicer.	Oneida.....D9
	.....	own...	motr..	1400	14	Stmbg	vac...	d-d...	own...	selec...	own...	amid..	4	worm.	own...	.....	.....	.....	own...	.....	.....	.....	Ross.	.....	.....	Spicer.	Oneida.....E9
	.....	.....	.....	.....	.....	Stmbg	vac...	d-d...	Covert.	selec...	Covert.	amid..	4	worm.	Emp...	7.25	sprgs..	sprgs..	Coop.	int-r-w.	int-r-w.	l....	Ross.	r....	fab..	Sneed..	Patriot.....Lincoln
	.....	.....	.....	.....	.....	.....	vac...	d-d...	Covert.	selec...	Covert.	amid..	4	worm.	Emp...	10.60	sprgs..	sprgs..	Coop.	int-r-w.	int-r-w.	l....	Ross.	r....	fab..	Sneed..	Patriot.....Washington
	cent.	Hink..	motr..	1400	.....	Stmbg	grv...	d-d...	own...	selec...	own...	amid..	4	worm.	own...	7.75	sprgs..	sprgs..	own...	int-r-w.	int-r-w.	l....	own...	ctr..	f&m..	opt....	Reynolds.....
	cent.	Hink..	motr..	1400	.....	Stmbg	grv...	d-p...	own...	selec...	own...	amid..	4	worm.	own...	7.75	sprgs..	sprgs..	own...	int-r-w.	int-r-w.	l....	own...	ctr..	f&m..	opt....	Reynolds.....
	cent.	Hink..	motr..	1400	.....	Stmbg..	grv...	d-p...	own...	selec...	own...	amid..	4	worm.	own...	8.10	sprgs..	sprgs..	own...	int-r-w.	int-r-w.	l....	own...	ctr..	f&m..	opt....	Reynolds.....
	cent.	Hink..	motr..	1400	.....	Stmbg	grv...	d-p...	own...	selec...	own...	amid..	4	worm.	own...	10.20	sprgs..	sprgs..	own...	int-r-w.	int-r-w.	l....	own...	ctr..	f&m..	opt....	Reynolds.....
	cent.	Simp..	motr..	1100	13	Stmbg..	grv...	d-p...	B&B...	selec...	B-Lipe.	amid..	4	worm	Timkn.	8.75	r-rd...	sprgs..	Mth..	int.....	int.....	l....	Ross.	ctr..	mtl..	Spicer.	Service.....71
	.....	.....	.....	.....	30	Stmbg.	grv...	d-d...	Fuller..	selec...	Fuller..	motr..	3	int-g..	Clrk...	6.00	sprgs..	sprgs..	Det...	ext-d-s.	ext-r-w.	l....	Gim..	ctr..	mtl..	Unvsl..	Triangle.....AA
	cent..	Wav...	.....	.....	18	Stmbg..	grv...	d-d...	Fuller..	selec...	Fuller..	motr..	3	int-g..	Clrk...	8.00	sprgs..	sprgs..	Det...	ext-d-s.	ext-r-w.	l....	Gem..	ctr..	mtl..	Unvsl..	Triangle.....C
	cent.	Wau..	motor	1400	35	John...	grv...	w-d...	B-Lipe.	selec...	B-Lipe.	motor.	3	worm.	own...	.....	sprgs..	sprgs..	Shel..	int-r-w.	int-r-w.	l....	Lavn..	ctr..	mtl..	M&E..	Watson.....
	suct.	Mnrch.	motor	1350	17	Stmbg..	grv...	d-d...	Fuller..	selec...	Fuller..	motr..	3	int-g..	Russ...	.....	sprgs..	sprgs..	Tuth..	ext-r-w.	int-r-w.	l....	Gem	ctr..	mtl..	Unvsl..	Wolverine.....D

Steam Trucks

SYSTEM			ENGINE						TRANSMISSION					CONTROL						Name and Mode
Feed Pump Type	Feed Control	Location	No. of Cylinders	Cylinders Cas	Valve Location	Valve Action	Valve Stroke	Reverses By	Final Drive	Gear-Ratio	Axle Type	Propulsion Taken By	Torque Taken By	Throttle	Hook-up	Reverse	Steering Wheel Location	Brake Lever Location		
none...	auto...	rear axle..	4	2	yl-ends	Stokesbary	adjust-able...	lever.....	d-rd....	3.00-1	s-fltng	springs....	.....	lever.....	.....	.....	right*....	center....		Steam-O-Truck..

Introducing

The two men through whose intelligent co-operation
Motor Age is able to offer its series on

STANDARD MECHANICAL OPERATIONS IN TRACTOR SERVICE

BY

JOHN CHARLES THORPE, M. E.,

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Special Apprenticeship in Machine Shop.

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Expert in the application of photography to the portrayal of Standard Mechanical Operations.

Extensive Contributor to Trade Papers and Magazines on subjects relating to "Farm Tools, Their Use and Care."

STANDARD MECHANICAL OPERATIONS
IN TRACTOR SERVICE
BEGINNING FEB. 5

Buyer's Guide to Tractors

FACTORY RATING OR HORSEPOWER USED

One and Two Plows

Name and Model	Drawbar HP.	Belt HP.	Price	Traction	Cylinders	Fuel
Appelton	12	20	$1650	2 w.	4 ver.	G-K-D
Allis-Chalmers	6	12	695	2 w.	4 ver.	G
Automotive	12	25	.....	2 w.	4 ver.	G-K
Avery	7	12	.....	2 w.	6 ver.	G
Avery	8	16	.....	2 w.	2 hor.	G-K
Bull	12	24	1200	1 w.	2 hor.	G-K-D
Case	10	18	1200	2 w.	4 ver.	K
Celtrac	12	20	1585	2 cr.	4 ver.	G-K-D
Eagle	12	22	1400	2 w.	2 hor.	G-K-D
Fageol	9	12	1525	2 w.	4 ver.	K
Fordson	12	20	750	2 w.	4 ver.	K
Heider	9	16	.....	2 w.	4 ver.	G-K
Indiana	5	10	.....	2 w.	4 ver.	K
International	8	16	.....	2 w.	4 ver.	G-K-D
La Crosse	7	12	750	2 w.	2 hor.	K
Leader	12	24	1285	2 w.	4 ver.	K
Moline	9	18	1500	2 w.	4 ver.	G
Monarch	9	16	1550	2 cr.	4 ver.	G-K
Post	....	....	.....	2 w.	4 ver.	G-K
Shelby	9	18	.....	2 w.	4 ver.	G
Toro	7	12	900	2 w.	4 ver.	K
Vim	10	20	1485	2 w.	4 ver.	G-K
Wetmore	12	25	1385	2 w.	4 ver.	G

Three Plows

Name and Model	Drawbar HP.	Belt HP.	Price	Traction	Cylinders	Fuel
Advance-Rumley	12	20	.....	2 w.	2 hor.	K-D
Allis-Chalmers	18	30	1785	2 w.	4 ver.	K
Allwork	14	28	1650	2 w.	4 ver.	G-K-D
Appleton	12	20	.....	2 w.	4 ver.	G-K
Avery	12	25	.....	2 w.	2 hor.	G-K-D
Avery	14	28	.....	2 w.	4 hor.	G-K-D
Bates	15	22	1985	2 cr.	4 ver.	G-K-D
Best	12	25	.....	1 cr.	4 ver.	D
Bull	12	24	1200	1 w.	2 hor.	G-K-D
Burn-Oil	15	30	1550	2 w.	2 hor.	K
Case	15	27	1600	2 w.	4 ver.	K
Dart	12	25	1850	2 w.	4 ver.	G
Dart	15	30	2000	2 w.	4 ver.	G
Dauch	10	20	1650	2 w.	4 ver.	G
Eagle	16	30	1850	2 w.	2 hor.	G-K-D
E-B aa	12	20	.....	2 w.	4 ver.	K
E-B Q	12	20	.....	2 w.	4 ver.	K
Four Drive	20	35	2800	4 w.	4 ver.	K
Frick	12	24	.....	2 w.	4 ver.	K
G. O.	14	28	1485	2 w.	4 ver.	G-K
Graham	15	30	.....	2 w.	4 ver.	K
Heider	12	20	.....	2 w.	4 ver.	G-K
Hart-Parr	15	30	1395	2 w.	2 hor.	K
Huber	12	25	.....	2 w.	4 ver.	G-K
J. T.	16	40	2800	2 cr.	4 ver.	K
Keck-Gonnerman	12	24	1500	2 w.	2 hor.	K
La Crosse	12	24	1250	2 w.	2 hor.	K
Lauson	15	30	2150	2 w.	4 ver.	G-K-D
Leader	18	36	2475	2 cr.	4 ver.	K
Parrett	12	25	.....	2 w.	4 ver.	K
Peoria	12	25	1985	2 w.	4 ver.	K
Plow Man	15	30	1895	2 w.	4 ver.	G-K
Pope	15	27	1750	Dr.	4 ver.	K
Reed	12	25	1685	2 w.	4 ver.	G-K
Short Turn	20	40	1500	1 w.	4 ver.	G-K
Square Turn	18	35	1875	2 w.	4 ver.	G-K
Titan	10	20	.....	2 w.	2 hor.	G-K-D
Topp-Stewart	20	35	3000	2 w.	4 ver.	G
Turner	14	30	1675	2 w.	4 ver.	G-K
Twin City	12	20	1595	2 w.	4 ver.	G-K
U. S.	20	30	2300	2 w.	4 ver.	K
Wallis	15	25	.....	2 w.	4 ver.	G-K-D
Waterloo Boy	12	25	.....	2 w.	2 hor.	K
Wisconsin	16	30	.....	2 w.	4 ver.	K
Yuba	12	20	2945	2 cr.	4 ver.	D

Four Plows

Name and Model	Drawbar HP.	Belt HP.	Price	Traction	Cylinders	Fuel
Advance-Rumely	16	30	.....	2 w.	2 hor.	K-D
Allis-Chalmers	18	30	1785	2 w.	4 ver.	K
Aulliman-Taylor	15	30	2300	2 w.	4 ver.	G-K-D
Avery	12	25	.....	2 w.	2 hor.	G-K-D
Avery	14	28	.....	2 w.	4 hor.	G-K-D
Avery	18	36	.....	2 w.	4 hor.	G-K-D
Bates	15	22	1985	2 cr.	4 ver.	G-K-D
Best	12	25	2600	2 cr.	4 ver.	D
Buckeye	25	40	3750	2 cr.	4 ver.	G-K-D
Case	22	40	2600	2 w.	4 ver.	K
Dart	15	30	2000	2 w.	4 ver.	G
Dauch	15	35	2500	2 w.	4 ver.	G-K-D
Flour City	20	35	.....	2 w.	4 ver.	G-K
Four Drive	20	35	2800	4 w.	4 ver.	K
G. O.	14	28	1485	2 w.	4 ver.	G-K
Gray	18	36	.....	Dr.	4 ver.	K
Hart-Parr	15	30	1395	2 w.	2 hor.	K
Holt	25	40	.....	2 cr.	4 ver.	G
Illinois	18	30	2375	2 w.	4 ver.	K
International	15	30	.....	2 w.	4 hor.	G-K-D
Lauson	15	30	2150	2 w.	4 ver.	G-K-D
Leader	18	36	2495	2 cr.	4 ver.	K
Leader	20	40	2750	2 cr.	4 ver.	K
Liberty	18	32	2475	2 w.	4 ver.	G-K
Monarch	30	18	2550	2 cr.	4 ver.	G-K
Pioneer	18	36	.....	2 w.	4 ver.	G
Plow Man	15	30	1895	2 w.	4 ver.	G-K
Stinson	18	36	1800	2 w.	4 ver.	K
Twin City	16	30	2400	2 w.	4 ver.	G-K
Topp-Stewart	20	35	3000	2 w.	4 ver.	G
Wisconsin	16	30	.....	2 w.	4 ver.	K

Five and Six Plows

Name and Model	Drawbar HP.	Belt HP.	Price	Traction	Cylinders	Fuel
Advance-Rumely	20	40	.....	2 w.	2 hor.	K-D
Aulliman-Taylor	22	45	3700	2 w.	2 hor.	G-K-D
Avery	25	50	.....	2 w.	4 hor.	G-K-D
Case	22	40	2600	2 w.	4 ver.	K
E-B	20	35	.....	2 w.	4 ver.	K
Flour City	20	35	.....	2 w.	4 ver.	G-K
Flour City	30	50	.....	2 w.	4 ver.	G-K
Holt	25	40	.....	2 cr.	4 ver.	G
Holt	40	50	.....	2 cr.	4 ver.	G
Leader	20	40	.....	2 cr.	4 ver.	K-D
Nichols & Shepard	25	50	.....	2 w.	2 hor.	K
Twin City	25	45	3800	2 w.	4 ver.	G-K
Yuber	20	35	4465	2 cr.	4 ver.	D

Eight Plows and Larger

Name and Model	Drawbar HP.	Belt HP.	Price	Traction	Cylinders	Fuel
Advance-Rumely	30	60	.....	2 w.	2 hor.	K-D
Aultiman-Taylor	30	60	4800	2 w.	4 hor.	G-K-D
Avery	40	80	.....	2 w.	4 hor.	G-K-D
Best	35	60	5750	2 cr.	4 ver.	D
E-B	40	65	.....	2 w.	4 ver.	K
Flour City	30	40	.....	2 w.	4 ver.	G-K
Flour City	40	70	.....	2 w.	4 ver.	G-K
Holt	40	60	.....	2 cr.	4 ver.	G
Nichols & Shepard	35	70	.....	2 w.	2 hor.	K
Pioneer	30	60	.....	2 w.	4 ver.	G-K
Twin City	40	65	4850	2 w.	4 ver.	G-K
Twin City	60	90	5850	2 w.	6 ver.	G-K

Abbreviations—w, wheel; cr., crawler; G, gasoline; K, kerosene; D, distillate.

Motor Age Monthly Guide to Tractors

Tractor specifications appear the last issue of each month

Line No.	Manufacturer	Tractor and Model	Drawbar horsepower	Belt horsepower	Number plows recommended	Size separator recommended	Pounds pull drawbar	Weight	Price	Traction	Diameter drive wheels	Make of engine	No. and type of cylinder	Bore and stroke	Normal R. P. M.
1		Oil Pull	12	20	3	22 x 36	2150	6682	.....	Wh.	51	Own	2 Hor.	6 x 8	560
2	Advance-Rumely Thresher Co. Laporte Ind.	Oil Pull	16	30	4	28 x 44	2850	9600	.....	Wh.	56	Own	2 Hor	7 x 8½	530
3		Oil Pull	20	40	5-6	32 x 52	3750	12820	.....	Wh.	64	Own	2 Hor.	8 x 10	450
4		Oil Pull	30	60	8-10	36 x 60	5900	26700	.....	Wh.	80	Own	2 Hor.	10 x 12	375
5	Allis-Chalmers Mfg. Co., Milwaukee, Wis.	Allis-Chalmers, 18-30	18	30	3-4	.....	3000	6000	$1,785	Wh.	50	Own	4 Ver.	4¾ x 6½	830
6	Appleton Mfg. Co., Batavia, Ill.	Appleton	12	20	2-3	22	2000	4900	1,650	Wh.	54	Buda	4 Ver.	4¼ x 5½	1009
7	Aultman-Taylor Machinery Co., Mansfield, O.	Aultman-Taylor	15	30	4	28	2800	7500	2,300	Wh.	70	Clim.	.....	5 x 6½	900
8												Wauk.	4 Ver.	4¾ x 6¾	
9		Aultman-Taylor	22	45	6	32	4800	13000	3,700	Wh.	70	Own	4 Hor.	5⅛ x 8	600
10		Aultman-Taylor	30	60	8-12	.....	8000	23000	4,800	Wh.	90	Own	4 Hor.	7 x 9	500
11	Automotive Corp., Toledo, Ohio	Automotive, B-B	12	25	2	30	1800	.....	.....	Wh.	40	Herc.	4 Ver.	4 x 5⅛	1000
12															
13															
14		Avery, 8-16	8	16	2-3	22 x 32	1800	4900	.....	Wh.	50	Own	2 Hor	5½ x 6	600-700
15															
16		Avery, 12-25	12	25	3-4	20 x 30	2800	7500	.....	Wh.	56	Own	2 Hor.	6½ x 7	600-700
17		Avery, 14-28	14	28	3-4	24 x 36	3000	6800	.....	Wh.	60	Own	4 Hor.	4⅝ x 7	600-800
18	Avery Co , Peoria, Ill.	Avery, 18-36	18	36	4-5	24 x 36	3500	9250	.....	Wh.	65	Own	4 Hor.	5½ x 6	650-750
19						28 x 46									
20		Avery, 25-50	25	50	5-6	28 x 46	4800	12500	.....	Wh.	69	Own	4 Hor.	6½ x 7	600-700
21						32 x 54									
22		Avery, 40-80	40	80	8-10	36 x 60	7600	22000	.....	Wh.	87½	Own	4 Hor.	7¾ x 8	500-600
23	Bates Mach. & Trac. Co , Joliet, Ill.	Steel Mule	15	22	3	28-30	.....	4000	1,985	Cr.	.....	Erd	4 Ver.	4 x 6	900
24															
25		Tracklayer, B	12	25	3	.....	2000	5100	2,600	Cr.	.....	Own	4 Ver.	4⅝ x 5¼	850
26	C. L. Best Gas Trac. Co., San Leandro, Calif.														
27		Tracklayer, A	35	60	9	.....	6500	17500	5,750	Cr.	.....	Own	4 Ver.	6½ x 3½	650
28															
29	Buckeye Mfg. Co., Anderson, Ind.	Trundaar, 10	25	40	4	.....	3750	8800	3,750	Ch. T.	.....	Wauk.	4 Ver.	5 x 6¼	900
30	Bull Tractor Co., Anderson, Ind.	Bull	12	24	2-3	26	1000	4996	1,200	.....	60	Toro	2 Hor.	5½ x 7	750
31	Burn-Oil Tractor Co , Peoria, Ill.	Burn-Oil, A	15	30	3	26	.....	5500	1,550	.....	56	Own	2 Hor.	6¾ x 7	700
32															
33	J. I. Case Plow Works Co., Racine, Wis.	Wallis, K	15	25	3	.....	2000	3560	.....	Wh.	48	Own	4 Ver	4¼ x 5¾	850
34		Case, 10-18	10	18	2	20 x 28	1665	3400	1,200	Wh.	42	Own	4 Ver.	3⅞ x 5	1050
35	J. I. Case T. M. Co., Racine, Wis.	Case, 15-27	15	27	3	20 x 36	2500	5750	1,600	Wh.	52	Own	4 Ver.	4½ x 6	900
36		Case, 22-40	22	40	4-6	26 x 46	3428	9500	2,600	Wh.	56	Own	4 Ver.	5½ x 6¾	850
37															
38	Cleveland Trac. Co., Cleveland, Ohio	Cletrac, H	12	20	2	24-40	1285	3300	1,585	Cr.	.....	Own	4 Ver	3¾ x 5½	1265
39															
40	Dart Truck & Trac Corp , Waterloo, Ia.	Blue J, T. E	12	25	3	24	2250	4300	1,850	Wh.	42	Buda	4 Ver.	4¼ x 5½	1050
41		Blue J	15	30	3-4	28	2500	4500	2,000	Wh.	42	Buda	4 Ver.	4½ x 6	1050
42		Sandusky, J	10	20	3	22	2000	4080	1,650	Wh.	48	Own	4 Ver	4¼ x 5¼	1050
43	Dauch Mfg. Co., Sandusky, Ohio														
44		Sandusky, E	15	35	4	30	3500	7670	2,500	Wh	56	Own	4 Ver.	5 x 6½	750
45		Leader, B	12	24	2	20	2000	5200	1,285	.....	48	Own	2 Hor	6¼ x 6	800
46	Dayton-Dowd Co., Quincy, Ill.	Leader, C	18	36	3-4	28	4000	6500	2,495	Cr.	.....	Twin	4 Ver.	5 x 7½	750
47		Leader, CX	20	40	4-5	28	5000	6500	2,750	Cr.	.....	Doman	4 Ver.	6 x 7	750
48	Eagle Mfg. Co , Appleton, Wis.	Eagle, F	12	22	2-3	24	2400	5850	1,290	Wh.	48	Own	2 Hor.	7 x 8	450
49		Eagle, F	16	30	3-4	28-30	3200	7100	1,750	Wh.	52	Own	2 Hor	8 x 8	450
50	Electric Wheel Co , Quincy, Ill.	Allwork, C	14	28	3	28	3000	5000	.....	Wh.	48	Own	4 Ver.	5 x 6	800
51		E B, Q	12	20	3	24	2000	6500	.....	Wh.	60	Own	4 Ver.	4¾ x 5	850
52	Emmerson, Brantingham Co., Rockford, Ill.	E-B, 12-20, AA	12	20	3	24	2600	4355	.....	Wh.	54	Own	4 Ver.	4¾ x 5	900
53		E-B, 20-35	20	35	5	28	3300	9700	.....	Wh.	72	Own	4 Ver.	5 x 7	700
54		E-B, Reeves	40	60	8-10	44	10000	22750	.....	Wh.	90	Spec.	4 Ver.	7¼ x 9	500
55	Fageol Motors Co., Oakland, Calif.	Fageol, D	9	12	2	.....	1450	3500	1,525	.....	48	Lyc.	4 Ver.	3½ x 5	1250
56	Ford & Son, Inc., Henry, Dearborn, Mich.	Fordson	12	20	2	20-34	.....	2750	750	.....	42	Own	4 Ver.	4 x 5	1000
57															
58	Four-Drive Trac. Co , Big Rapids, Mich.	Fitch, 4	20	35	3-4	28-30	3200	6000	2,800	Wh.	F- 36x12 R- 42x12	Clim.	4 Ver.	5 x 6½	850
59															
60	Frick Co , Waynesboro, Pa.	Frick	12	24	3	22-26	.....	5800	.....	Wh.	60	Erd.	4 Ver.	4 x 6	900-1000
61		Frick	15	30	3-4	26	.....	6000	.....	Wh.	60	Beaver	4 Ver.	4¾ x 6	900-1000
62	General Ordinance Co., Cedar Rapids, Ia.	G-O	14	28	8	30	.....	4200	1,485	Wh	46	Wauk.	4 Ver.	4½ x 5¾	1000
63	Gray Tractor Co., Minneapolis, Minn.	Gray	18	36	4	28	3300	6200	.....	Drum	54	Wauk.	4 Ver.	4¾ x 6¾	850
64	Hart-Parr Co., Charles City, Ia.	Hart-Parr, 30	...	30	3	28	3000	5570	1,395	Wh.	52	Own	2 Hor	6½ x 7	750
65															
66	Holt Mfg. Co. Peoria, Ill.	Caterpillar, 5-Ton	25	40	4	32-52	3100	9400	.....	Cr.	.....	Own	4 Ver.	4¾ x 6	1050
67		Caterpillar, 10-Ton	40	60	6	40-60	5000	19000	.....	Cr.	.....	Own	4 Ver.	6½ x 7	700
68	Huber Mfg. Co., Marion, Ohio	Huber, 12-25	12	25	3	24 x 42	2400	5000	.....	Wh.	60	Wauk.	4 Ver.	4½ x 5¾	1000
69	Illinois Tractor Co., Bloomington, Ill.	Illinois, C	18	30	4	24 - 28	3500	5200	2,375	Wh.	54	Clim.	4 Ver.	5 x 6½	800
70		International	8	16	2	.....	1350	3600	.....	Wh.	40	Own	4 Ver.	4¼ x 5	1000
71	International Harvester Co., Chicago	Titan	10	20	3	.....	1800	5710	.....	Wh.	54	Own	2 Hor.	6½ x 8	575
72		International	15	30	4	.....	2500	8990	.....	Wh.	66	Own	4 Hor.	5¼ x 8	575
73	J. T. Tractor Co., Cleveland, Ohio.	J. T., N	16	40	3	30	3200	6500	2,800	Cr.	.....	Chief	4 Ver.	4¾ x 6	1000
74	Kardell Trac. & Tr. Co., St. Louis, Mo.	Kardell Utility	10	20	2	.....	.....	3500	.....	.....	.....	Wis.	4 Ver.	4 x 5	.....

Nutt., Nuttall. Gearset type—Sl. G., sliding gear; Sel. G., selective gear; Fr., Veer., Veerac; Herc., Hercules; Wauk., Waukesha; Buff., Buffalo; Asso., Kenn., Kenneth. Cylinders—Ver., vertical; Hor., horizontal; Opp., opposed. Fuel—G, gasoline; K, kerosene; D, distillate. Carbureter—Ray, Rayfield; King., Cr., Carter; Perr., Perrin-Ingram. Air-Cleaner—Donal., Donaldson; Ben., Bennett; Hol., Holley. Magneto—A-K, Atwater Kent; Sum., Sumter; Eise., Nutt., Nuttall. Gearse type—Sl. G., sliding gear; Sel. G., selective gear: Fr...friction; Plan., planetary; Sl., J. C., sliding jaw clutch. Final drive—S. G., spur

and Their Technical Specifications

These tables are revised and brought up to date monthly

Line No.	Fuel	Make and size of carburetor	Make of air cleaner	Make of magneto	Make of clutch	Make of gearset	Type of gearset	Make of radiator	Make of bearings in transmission	Make of bearings in front axle	Make of bearings in rear axle	Belt pulley diameter	Belt pulley R. P. M.	Belt Speed F. P. M.	Speeds forward	Speed range M. P. H.	Recommended plowing speed	Final Drive	Drive	Furrow wheel	Line No.
1	K-D	2¼-Own	Donal.	Bosch	Own	Own	Sl. G.	Owr	Own	Own	Hyatt	19	5 0	2790	2	2.1-3.26	2.1	B. G.	Op.	No	1
2	K-D	2½-Own	Donal.	Bosch	Own	Own	Sl. G.	Own	Own	Own	Hyatt	23	530	3190	2	2.1-3	2.1	G. B.	Op.	No	2
3	K-D	2¾-Own	Donal.	Bosch	Own	Own	Sl. .	Own	Own	Own	Hyatt	26	450	3060	2	2-3.2	2	B. G.	O .	No	3
4	K-D	3¼-Own	None	Bosch	Own	Own	Sl. G.	Own	Own	Own	Own	36	375	3540	1	1.9	1.9	B. G.	Op.	No	4
5	G-K	1½-King	Ben.	Opt.	Own	Own	Sl G.	Own	Hyatt	Own	Hyatt	15	830	3200	2	2.3-2.8	2.8	.....	.....	Yes	5
6	G-K	1¼-Scheb.	Ben.	Bosch	B. & B	Nutt.	Sl. G	Perfex	Hyatt	Own	Hyatt	7½	825	2600	2	2¼-3½	.....	I. G.	.....	Yes	6
7	G-K-D	1⅜-King.	Ben.	Eise.	Own	Own	Sl. G.	Hooven	Hyatt	Own	Hyatt	20	450	2400	1	2.2-2.49	2.5	I. G.	.....	Yes	7
8																					8
9	G-K-D	2 -King.	.....	Eise.	Own	Own	Sl. G.	Own	Own	Own	Own	20	600	3150	.....	1.2.93	2.13	B G.	.....	No	9
10	G-K-D	2½-King	.....	Eise.	Own	Own	.....	Own	Own	Own	Own	24	700	3150	2.2	1-2.2	2.2	B. G.	.....	No	10
11	G-K	1⅝-King	Ben.	Eise.	B. & B	Own	Sl. G.	MeCord	U. S. Gurney Hyatt	Timk.	Timk.	10	996	2600	2	2¼-4	2¼	I. G.	In.	Yes	11
12																					12
13																					13
14	G-K	1¼-King.	.....	K-W	Own	Own	C. M.	Own	.....	Own	Own	17½	600	2750	2	1¾-3	1¾	S. G.	Op.	.....	14
15	D-A																				15
16	G-K-D	1½-King	.....	K-W	Own	Own	C. M.	Own	.....	Own	Own	19½	570	2910	2	1¾-2¾	1¾	S. G.	Op.	.....	16
17	G-K-D	1¼-King	.....	K-W	Own	Own	C. M.	Own	.....	.....	Own	16	700	2930	2	2⅓-3½	2	S. G.	Op.	.....	17
18	G-K-D	1½-King.	.....	K-W	Own	Own	C. M.	Own	.....	Own	Own	18	650	3065	2	2-3	2	S G.	Op.	.....	18
19																					19
20	G-K-D	2-King.	.....	K-W	Own	Own	C. M.	Own	.....	Own	Own	22	500	2880	2	2-3	2	S. G.	Op.	.....	20
21																					21
22	G-K-D	2-King.	.....	K-W	Own	Own	C. M.	Own	.....	Own	Own	26	500	3400	2	1¾-2⅔	1¾	S. G.	Op.	.....	22
23	G-K-D	4¼-Ben.	Ben.	Dixie	B. & B	Own	Sl G.	Modine	Timk.	Timk.	T. & H.	12	725	2300	2	2.33-3.5	2.33	S. G.	.....	.....	23
24																					24
25	D	1½-Ens.	Ben.	Split.	Own	Own	Sl. G.	Own	Hyatt Timk.	.....	Hyatt	9	9000	1971	2	2¼-3	3	I. G.	.....	.....	25
26	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	26
27	D	2-Ens.	Ben.	Bosch	Own	Own	Sl. G.	Own	Hyatt Timk.	.....	Timk.	16	650	2720	2	3-2	3	I. G.	.....	.....	27
28																					28
29	G-K-D	Strom.	Own	Bosch	Hill.	Own	Sl. G.	Modine	Opt.	.....	H. & T.	....	900	2600	2	1.3-2.5	.....	S. G.	In.	.....	29
30	G-K-D	1½-King.	Donald.	K-W	.....	.....	.....	.....	.....	.....	Hyatt	12	750	.....	1	2.4-2¾	2.4	B. G.	.....	.....	30
31	K	1½-Scheb.	Ben.	K-W	Own	Own	.....	Spec.	S. K. F. Hyatt	Hyatt	Hyatt	13	750	750	2	1¾-3	2¾	G.	.....	.....	31
32																					32
33	G-K-D	1¼-Ben	Ben.	Bosch	Twin	Own	Sl. G.	Modine	Timk.	Hyatt	Timk.	18	430	.....	2	1½-3½	2½	S. G.	.....	.....	33
34	K	1⅛-King.	Own	King.	Own	Own	Sl. G.	Own	Hyatt	Own	Hyatt	14¼	1050	3916	2	2¼-3½	2¼	S. G.	In.	No	34
35	K	1⅜-King.	Own	Bosch	Own	Own	Sl. G.	Own	Hyatt	Own	Hyatt	16	900	3762	2	2¼-3½	2¼	S. G.	In.	No	35
36	K	2-King.	Own	Bosch	Own	Own	Sl. G.	Own	Hyatt Timk.	Timk	Hyatt	16½	850	3669	2	1.2-3.2	2.2	S. G.	In.	No	36
37																					37
38	G-K-D	1-King.	Own	Eise. Teagle	Own	Own	.....	McCord	.....	.....	.....	8	1265	2500	1	1-3½	3½	I. G.	.....	.....	38
39																					39
40	G	1¼-King.	R. W.	Split.	Delt.	Own	Sel. G.	Own	Gurney	Timk.	Timk.	12	710	2600	3	1¼-6	2½	B. G.	In.	Yes	40
41	G	1¼-King.	R. W.	Split.	Delt.	Own	Sel. G.	Own	Gurney	Timk.	Timk.	12	710	2600	3	1¼-6	2½	B. G.	In.	Yes	41
42	G-K-D	1¼-King.	Ben.	Dixie	Own	Own	Sel.	Perfex	Hyatt N. D.	Own	Own	10	1000	2600	2	2-3	2	I. G.	.....	Yes	42
43																					43
44	G-K-D	2 -King.	Ben.	Dixie	Own	Own	Sel.	C. & P.	Own	Own	Own	15	800	2950	3	2-5½	2	I. G.	.....	No	44
45	K	1½-King.	Own	King.	Own	Own	Sel.	Eureka	Own	Own	Own	14	800	2800	2	2¼-3½	2¼	I. G.	Op.	.....	45
46	K-D	1¾-King.	Ben.	K-W	Own	Own	Sel.	Eureka	Own	Own	Own	14	750	2700	2	1.8-2½	1.8	Ch.	Op.	.....	46
47	G-K-D	1½-Holl.	Ben.	Dixie	Own	Own	Sel.	Eureka	Own	Own	Own	14	750	2700	2	1.8-2½	1.8	Ch.	Op.	.....	47
48	G-K	1½-Linga	Own	Dixie	Own	Own	Sl. G.	Perfex	Hyatt	Own	Own	20	450	2350	2-3	1½	2	G.	.....	Yes	48
49	G-K	2 -Linga	Own	Dixie	Own	Own	Sl. G.	Perfex	Hyatt	Own	Own	24	450	2927	2-3	1½	2	G.	.....	Yes	49
50	K	1½-King.	Ben.	King.	Own	Own	Sl. G.	Perfex	Hyatt	.....	.....	13½	800	2500	3	1⅞-3¾	2½	B. G.	.....	.....	50
51	K	1½-Ben.	Ben.	K-W	Own	Own	Sl. G.	Perfex	Hyatt	Own	Hyatt	12	708	2225	3	1.64-2.25-3.4	3.4	G.	Op.	Yes	51
52	K	1½-Ben.	Ben.	K-W	Own	Own	Sl. G.	Modine	Hyatt	Own	Hyatt	12	900	2800	2	1.81-2.33	2.33	G.	In.	No	52
53	K	1½-Ben.	Ben.	K-W	Own	Own	Sl. G.	Perfex	Hyatt	Own	Hyatt	16	597	2500	2	1.71-2.26	2.26	G.	Op.	Yes	53
54	K	2½-Ben.	Ben.	K-W	Own	Own	Sl. G.	Perfex	Own	Own	Own	22	500	2880	1	2	2	B. G.	Op.	Yes	54
55	G-K-D	1-Zen.	Own	Dixie	Own	Own	C. M.	Modine	Timk.	Timk.	Timk.	8	1250	2600	1	¾-3	2½	S. G.	.....	.....	55
56	K	Own	Own	Own	Own	Own	Sl. G.	Own	Gurney	Timk.	Gurney S. R. B.	9½	1000	.....	3	1-8	2¾	Worm	In.	.....	56
57																					57
58	K	1½-King.	Ben.	Dixie	B. & B.	Cotta	Ind. Cl.	Spirex	Timk.	Timk.	Timk.	14	650	2275	3	¾-4	2½	F. Bevel R. Worm	.....	No	58
59																					59
60	K	-King.	Ben.	King.	Own	Nutt.	S.	Perfex	Hyatt	Own	Own	13	900	3060	2	2.3-3.8	2½	S. G.	.....	Yes	60
61	K	Ben.	Ben.	Dixie	Own	Nutt.	S.	Perfex	Hyatt	Own	Own	13	900	3060	2	2.3-3.8	2½	S. G.	.....	Yes	61
62	G-K	1¼-King.	Ben.	Eise.	.....	Own	C. M.	Perfex	S. K. F.	.....	.....	10	970	.....	6	1¾-3	2½	S. G.	In.	No	62
63	K	1¼-Strom.	Own	Berl.	Own	Own	Sl. G.	McCord	Hyatt	Timk.	Hyatt	12	930	2900	2	2½-4½	2¾	S. G.	In.	Yes	63
64	K	K-Shunt.	Own	K-W	Own	Own	Sl. G.	S-J	S. K. F. Hyatt	Own	.....	14	750	2750	2	2.4-3.5-2.3	3	I. G.	Op.	Yes	64
65																					65
66	G	1½-Scheb.	Donald.	Eise.	Own	Own	Sl. G.	Modine	Hyatt	Hyatt	Hyatt	12	1012	3150	3	1.5-5.7	3	G.	In.	No	66
67	G	2 -King.	Donald.	K-W	Own	Own	Sl. G.	Own	Hyatt	Hyatt	Hyatt	14	850	3120	3	1.65-4.78	3	G.	In.	No	67
68	G-K	1¼-King.	Ben.	King.	Own	Own	Sel.	Perfex	G. & H.	Own	Own	13	1000	.....	2	2. 3-3.75	.43	S. G.	Op.	Yes	68
69	K	1⅜-Strom.	Ben.	Dixie	Twin	Foote	Sl. G.	Modine	Hyatt	Hyatt	Hyatt	14	600	2400	2	2½-3.4	2½	S. G.	In.	Yes	69
70	G-K-D	-Ens.	.....	Dixie	Own	.....	Sl. G.	B. & L.	Own	Own	.....	12¼	623	.....	.....	1¾-4.1	2⅝	Ch	In.	.....	70
71	G-K-D	-Own	.....	K-W	Own	.....	Sl. G	.....	Own	Own	.....	18	575	.....	.....	2¼-2⅞	2⅞	Ch.	.....	.....	71
72	G-K-D	-Own	.....	K-W	Own	.....	Sl. G.	.....	Own	Own	.....	18	575	.....	.....	2¼-2⅞	2⅞	Ch.	.....	.....	72
73	K	1½-Own	Ben.	K-W	Own	Covert	Sel.	McCord	Timk.	Hyatt	Hyatt	10	1 00	2600	3	1¼-5	2½	I. G.	In.	No	73
74	G	1 -Carter	Ben.	Dixie	.....	.....	.....	Eureka	.....	.....	.....	.....	800	.....	2	.....	.....	.....	.....	.....	74

Associated Manufacturers; Auto., Automatic; Weid., Weidely; Clim., Climax; Twin, Twin City; Cont., Continental; Ruten., Rutenber; Over., Overland; Kingston; Holl., Holley; Scheb., Schebler; Ben., Bennett; Web., Webster; Zeph., Zephyr; Ens., Ensign; Strom., Stromberg; Till., Tilotson; Zen., Zenith; Eisemann; Berl., Berling. Clutch—B. & B., Borg & Beck; Bierman; Mun., Muncie; Rock., Rockwood; spec., special. Gearset—B. & S., Brown & Sharpe; gear; Ch., chain; D. R., double reduction; B. G., bull gear. Drive—Op., open; In., inclosed.

Motor Age Monthly Guide to Tractors

These tables are revised and brought up to date monthly

Line No.	Manufacturer	Tractor and Model	Drawbar horse power	Belt horsepower	Number plows recommended	Size separator recommended	Pounds pull drawbar	Weight	Price	Traction	Diameter drive wheels	Make of engine	No. and type of cylinder	Bore and stroke	Normal R. P. M.
75	Keck-Gonnerman Co., Mt. Vernon, Ind.	Keck-Gonnerman, B	12	24	3	24 x 40	2500	6500	1,500	Wh.	60	Own	2 Hor.	7¼ x 8	700
76		Flour City, Jr.	14	24	3	24					60	Own	4 Ver.	5 x 5	800
77	Kinnard & Sons Mfg. Co., Minneapolis, Minn.	Flour City	20	35	4-5	28		10000			72	Own	4 Ver.	5¼ x 6	800
78		Flour City	30	50	6-8	30		14000			84	Own	4 Ver.	6¼ x 7	550-600
79		Flour City	40	70	8-10	36		21000			96	Own	4 Ver.	7½ x 9	450-500
80	La Crosse Trac. Co., La Crosse, Wis.	La Crosse, G.	12	24	3	22	2000	4000	875	Wh.	56	Own	2 Hor.	6 x 7	750
81	Lanson, John, Mfg. Co., New Holstein, Wis.	Full Jewel	15	30	3-4	24 - 30	3000	6500	2,150	Wh.	54	Beav.	4 Ver.	4¾ x 6	950
82	Liberty Tractor Co., Minneapolis, Minn.	Liberty	18	32	4	30	3380	5900	2,475	Wh.	48	Clim.	4 Ver.	5 x 6½	850
83		Twin City, 12-20	12	20	3	20-24	2000	4200	1,595	Wh.	50	Own	4 Ver.	4½ x 6	1000
84		Twin City, 16-30	16	30	4	24-28	3000	7800	2,400	Wh.	54	Own	4 Ver.	5 x 7½	650
85	Minneapolis Steel & Machinery Co., Minneapolis,	Twin City, 25-45	25	45	6	32-34	6700	16000	3,800	Wh.	76	Own	4 Ver.	6¼ x 8	600
86	Minn.	Twin City, 40-55	40	65	8	40	7500	23700	4,850	Wh.	84	Own	4 Ver.	7¼ x 9	535
87		Twin City, 60-90	60	90	12	40	11250	2800	5,850	Wh.	84	Own	6 Ver.	7¼ x 9	535
88	Moline Plow Co., Moline, Ill.	Universal D.	9	18	2	22	2100	3380	1,500	Wh.	52	Own	4 Ver.	3½ x 5	1650
89	Nichols & Shepard Co., Battle Creek, Mich.	Oil-Gas, 25-50	25	50	6	25-32x52		19000		Wh.	28	Own	2 Hor.	9 x 12	350-425
90		Oil-Gas, 35-70	35	70	8-10	52-64		30000		Wh.	32	Own	2 Hor.	10½ x 4	300-375
91	Parrett Tractor Co., Chicago Heights, Ill.	Parrett, H.	12	25	3		2800	5225		Wh.	60	Buda	4 Ver.	4¼ x 5½	1000
92	Peoria Tractor Corp., Peoria, Ill.	Peoria, J.	12	25	3	26	3000	5100	1,985	Wh.	56	Clim.	4 Ver.	5 x 6½	800
93	Pioneer Tractor Co., Winona, Minn.	Pioneer, 18-36	18	36	4	28	4000	6100			60	Own	4 Ver.	5½ x 6	750
94		Pioneer, 30	30	60	10	36	8000	24000			96	Own	4 Ver.	7 x 8	650
95	Plow Man Tractor Co., Waterloo, Ia.	Plow Man, 15-30	15	30	3-4	30	3000	5100	1,895	Wh.	60	Buda	4 Ver.	4½ x 6	1000
96	Pope Mfg. Co., Watertown, S. D.	Dakota, 4.	15	27	3	24	2000	5700	1,750	Wh.	42	Doman	4 Ver.	4¾ x 6	800
97	Post Trac. Co., Clev eland	Post, D.	12	20	2			4300		Wh.	32	Wauk.	4 Ver.	4¼ x 5¾	800
98	Pt. Huron Eng. & T. Co., Pt. Huron, Mich.	Port Huron, 12-25	12	25	3	22-38	2200	5900		Wh.	56	Chief	4 Ver.	4¾ x 6	900
99															
100	Reed Fdy. & Mach. Co., Kalamazoo, Mich.	One-Man	12	25	3	22-24		5000	1,685	Wh.	60	Wauk.	4 Ver.	4½ x 5¾	1000
101	Rock Island Plow Co., Rock Island, Ill.	Heider, D.	9	16	2	20	1500	4000		Wh.	57	Wauk.	4 Ver.	4¼ x 5¾	800
102		Heider, C.	12	20	3	24	2000	6000			57	Wauk.	4 Ver.	4½ x 6¾	750
103		Russell Junior	12	24	2	18	2000	6200		2 Wh.	53	Wauk.	4 Ver.	4½ x 5¾	1000
104	Russell & Co., Massillon, Ohio.	Russell Little Boss	15	30	3	24	3000	6900		2 Wh.	53	Wauk.	4 Ver.	4½ x 6¾	950
105		Russell Big Boss	20	35	4	30	4000	7600		2 Wh.	60	Model	4 Ver.	5½ x 7	825
106		Russell Giant	30	60	8	40	8	24000		2 Wh.	84	Own	4 Ver.	8 x 10	525
107	Shelby Trac. & Tr. Co., Shelby, O.	Shelby, C.	9	18	2	20	2000	3500		Wh.	42	Wauk.	4 Ver.	3¾ x 5¼	1000
108	Short Turn Tractor Co., Minneapolis, Minn.	Short Turn, D.	20	40	3	24		5000	1,500	Wh.	65		4 Ver.	4¾ x 6	950
109															
110															
111	Square Turn Tractor Co., Norfolk, Nebr.	Square Turn, A.	18	35	3	28	3200	7400	1,875		60	Clim.	4 Ver.	5 x 6½	850
112	Stinson Trac. Co., Superior, Wis.	Stinson, 4-E.	18	36	4	28-30		7100		Wh.	60	Beav.	4 Ver.	4¾ x 6	950
113	Topp-Stewart Trac. Co., Clintonville, Wis.	Topp-Stewart, B.	20	35	3-5		5000	7500	3,000	Wh.	42	Wauk.	4 Ver.	4¾ x 6¾	900
114	Turner Mfg. Co., Pt. Washington, Wis.	Simplicity	14	40	3	24	2600	4300	1,675	Wh.	54	Buda	4 Ver.	4¼ x 5½	1000
115	U S. Trac. & Machy. Co., Menasha, Wis.	Uncle Sam, B-19	20	30	3	28	3000	4250			50	Beav.	4 Ver.	4¾ x 6	900
116	Vim Tractor Co., Schleisingerville, Wis.	Vim	10	20	2	20	1800	3200	1,485	Wh.	48	Wauk.	4 Ver.	3¾ x 5¼	1000
117	Waterloo Gasoline Eng. Co., Waterloo, Ia.	Waterloo Boy, N.	12	25	3		2000	5900		Wh.	52	Own	2 Hor.	6½ x 7	750
118	Wetmore, H. A., Sioux City, Ia.	Wetmore	12	25	2	22		2900	1,485	Wh.	46	Wauk.	4 Ver.	4 x 5¾	960
119	Wisconsin Farm Trac. Co., Sauk City, Wis.	Wisconsin, E.	16	30	3-4	28	3500	5440		Wh.	52	Clim.	4 Ver.	5 x 6½	800
120	Yuba Mfg. Co., Marysville, Calif.	Ball Thread	12	20	3		3500	6750	2,945	Cr.		Wauk.	4 Ver.	4½ x 6¾	700
121		Ball Thread	20	35	5-6		5000	10100	4,465	Cr.		Wisc.	4 Ver.	5¼ x 7	700

One- and Two-Horse Tractors

122	Allis-Chalmers Mfg. Co., Milwaukee, Wis.	General Purpose	6	12	1-16		1000	2500	795	Wh.	48	Le Roi	4 Ver.	3⅛ x 4½	1000
123	Atlantic Mch. Mfg. Co., Cleveland, Ohio	Merry Garden					250		185						
124	Avery Co., Peoria, Ill.	Avery, 5-10 B	5	10	2	22 x 32	800	2600		Wh.	38	Own	4 Ver.	3 x 4	1200
125		Avery, 6-cyl.	7	12		22-32		3150		Wh.	38	Own	6 Ver.	3 x 4	1200
126	Beeman Tractor Co., Minneapolis, Minn.	Beeman, G.	2	4	1-7	None	260	550	310	Wh.	25	Own	1 Ver.	3½ x 4½	850
127	Elderfield Mechanics Co., Pt. Washington, N. Y	Universal, 20	1	4	1		250	750	450		36	Own	1 Ver.	3½ x 5	1000
128	Indiana Silo Co., Anderson, Ind.	Indiana	5	10	1		900	2000		Wh.	50	Le Roi	4 Ver.	3⅛ x 4½	950
129	La Crosse Trac. Co., La Crosse, Wis.	La Crosse, M.	7	12	1-16	18	1000	2600	750	Wh.	48	Own	2 Hor.	4 x 6	1000
130	Market Garden Trac. Co., Minneapolis, Minn.	Market	2	4½	1-7			550			24	Vurac	1 Hor.	4 x 4	850
131	Midwest Engine Co., Indianapolis, Ind.	Utilitor	2	4	1		150-200	750	345	Wh.	24¾	Own	1 Ver.	3½ x 4½	1200
132	Scientific Farming Mchy., Minneapolis, Minn.	Princess Pat.	12	25	2	24-26	2000	3500	1,750	Wh.	46	Buda	4 Ver.	4¼ x 5½	1000
133	Toro Motor Co., Minneapolis, Minn.	Toro		12	2		1100	2400	900	Wh.	42	Le Roi	4 Ver.	3⅛ x 4½	1200

Motor Cultivators

134	Avery Co., Peoria, Ill.	Avery, C						3450		Wh.	38	Own	4 Ver.	3 x 4	1200
135	Bailor Plow Mfg. Co., Atchison, Kans.	Bailor, A	6					2150	925	Wh.	44	Le Roi	4 Ver.	3⅛ x 4½	1000
136		Bailor, W	6					1800	775	Wh.	40	Le Roi	4 Ver.	3⅛ x 4½	1000
137	Detroit Culto-Tractor Corp., Detroit, Mich.	Detroit Culto, AA	9	16	2	20x28	1600	1800	775	Wh.	42	Own	2 Ver.	4 x 6	400
138	Emmerson-Brantingham Co., Rockford, Ill.	E-B			None			3200		Wh.	42	Le Roi	4 Ver.	3⅛ x 4½	100
139	Toro Motor Co., Minneapolis, Minn.	Toro					1100	2700		Wh.	42	Le Roi	4 Ver.	3⅛ x 4½	1200
140	Wilson Trac. Co., Peoria, Ill.	Wilson, J.	6	12	2			3000	890		44	Le Roi	4 Ver.	3⅛ x 4½	1000

Abbreviations: Traction—Wh., wheel; Cr., crawler. Engine—Beav., Beaver; Veer., Veerac; Herc., Hercules; Wauk., Waukesha; Buff., Buffalo; Asso., Kenn., Kenneth. Cylinders—Ver., vertical; Hor., horizontal; Opp., opposed. Fuel—G, gasoline; K, kerosene; D, distillate. Carbureter—Ray, Rayfield; King., Cr., Carter; Perr., Perrin-Ingram. Air-Cleaner—Donal., Donaldson; Ben., Bennett; Hol., Holley. Magneto—A-K, Atwater Kent; Sum., Sumter; Eise., Nutt., Nuttall. Gearset type—Sl. G., sliding gear; Sel. G., selective gear; Fr., friction; Plan., planetary; Sl., J. C., sliding jaw clutch. Final drive—S. G., spur

and Their Technical Specifications

Tractor specifications appear the last issue of each month

Line No.	Fuel	Make and size of carburetor	Make of air cleaner	Make of magneto	Make of clutch	Make of gearset	Type of gearset	Make of radiator	Make of bearings in transmission	Make of bearings in front axle	Make of bearings in rear axle	Belt pulley diameter	Belt pulley R. P. M.	Belt Speed F. P. M.	Speeds forward	Speed range M. P. H.	Recommended plowing speed	Final Drive	Drive	Furrow wheel	
75	K	2 -Scheb.	Ben.	Bosch	Own	Own	Sl. G.	Own	.....	.....	.....	11½	700	.....	3	2½-3½	3	S. G.	.....	.....	75
76	G-K	1½-Scheb.	.....	K-W	Own	Own	.....	Long	Hyatt	.....	.....	26	320	.....	2	2¼-3¼	2¼	G.	.....	.....	76
77	G-K	1½-Scheb.	.....	K-W	Own	.....	Sel.	Modine	.....	.....	.....	26	350	.....	2	2¼-3	2¼	G.	.....	.....	77
78	G-K	2 -Scheb.	.....	K-W	Own	.....	.....	Modine	.....	.....	.....	32	275	.....	1	.....	2½	G.	.....	.....	78
79	G-K	2½-Scheb.	.....	K-W	Own	.....	.....	Modine	.....	.....	.....	34	275	.....	1	.....	2½	G.	.....	.....	79
80	K	1½-King.	Ben.	.....	Own	Own	.....	Modine	Hyatt	Hyatt	Hyatt	7x11	750	2125	1	2-2¾	2½	.....	.....	Yes	80
81	G-K-D	1⅜-King.	.....	Dixie	Own	Own	Sl. G.	Perfex	Hyatt	Timk.	Hyatt	18	475	2200	2	1¾-2½	2½	G.	In.	.....	81
82	G-K	1½-Strom.	Ben.	Dixie	Bier.	Own	.....	S-J	Hyatt	Own	Ownt	12	900	2825	2	2½-5	2½	S. G.	In.	Yes	82
83	G-K	1¼-Holl.	Ben.	Bosch	B. & B.	Own	Sl. G.	Modine	Hyatt	Own	Hyatt	16	650	2700	2	2.°-2.9	2.9	S. G.	In.	Yes	83
84	G-K	1½-Holl.	Ben.	K-W	Own	Own	Sl. G.	Modine	Hyatt	Own	Hyatt	17	528	2350	2	2-2.75	2¾	S. G.	In.	.....	84
85	G-K	2 -King.	.....	K-W	Own	Own	Sl. G.	Own	Own	Own	Own	20	600	3150	2	1.4-2	2	S. G.	Op.	.....	85
86	G-K	2½-King.	.....	K-W	Own	Own	Sl. G.	Own	Own	Own	Own	23	535	3200	1	2	2	G.	Op.	.....	86
87	G-K	3 -King.	.....	K-W	Own	Own	Sl. G.	Own	Own	Own	Own	23	535	3200	1	2	2	S.	Op.	.....	87
88	G	1½-Holl.	Ben.	Remy	B. & B.	Own	Sl. G.	Modine	Hyatt	.....	Hyatt	9	.....	2600	1	½-3½	3½	G.	In.	Yes	88
89	K	2½-King.	.....	Wico.	Own	Own	Sl. G.	Perfex	Own	Own	Own	9x24	.....	.....	1	2-2.42	2-2.42	S. G.	.....	.....	89
90	K	3 -King.	.....	Wico.	Own	Own	Sl. G.	Perfex	Own	Own	Own	12x30	.....	.....	1	1.86	1.86	S. G.	.....	.....	90
91	K	1¼-King.	Own	Eise.	Own	Own	Sl. G.	Perfex	.....	Hyatt	Hyatt	12	1000	3141	3	1.80-4	.....	I. G.	In.	.....	91
92	K	1½-Strom.	Ben.	Eise.	Own	Nutt.	Sl. G.	Eureka	Hyatt	.....	.....	14	650	2500	2	2½-4	2½	I. G.	.....	Yes	92
93	G-K	1½-King.	Ben.	K-W	Own	Own	.....	S-J	Timk.	Timk.	Timk.	14	750	.....	3	1¾-4	2½	S. G.	.....	.....	93
94	G-K	2 -King.	Ben.	K-W	Own	Own	Sl. G.	S-J	Own	Own	Own	17½	650	.....	3	1¾-4¼	2½	.....	.....	.....	94
95	G-K	1¼-Strom.	Len.	Dixie	Twin	Foote	Sl. G.	Perfex	Hyatt	Hyatt	Hyatt	14	590	2200	2	2-3	.....	I. G.	Op.	.....	95
96	K	1¼-Linga	John.	K-W	Bier.	Own	Sl. G.	S-J	Own	Own	Own	14	800	2500	1	3	3	Ch.	.....	Yes	96
97	G-K	-King.	Ben.	Splt.	Own	Own	.....	Perfex	Opt.	Timk.	Timk.	14	2500	.....	2	3-3	3	G.	.....	Yes	97
98	G-K	1⅜-King.	.....	King.	Own	Own	.....	Bremer	S. K.F.	Plain	Plain	14	650-	2380-	7	1⅞-4	2	S. G.	In.	Yes	98
99		-King.											1065	3900							99
100	G-K	1¼-Ben.	Ben.	Dixie	Bier.	Own	Sl. G.	Modine	Hyat	.....	Hyatt	14½	2600	703	2½-3½	.....	2½	B. G.	In.	Yes	100
101	G-K	1 -King.	Ben.	Dixie	Own	.....	Fr.	Perfex	U. S.	.....	Own	12	700	2200	7	1-5	1¼	B. G.	Op.	Yes	101
102	G-K	1⅜-King.	Ben.	Dixie	Own	.....	Fr.	Perfex	U. S.	.....	Own	14	600	2200	7	1-4	2¼	B. G.	.....	Yes	102
103	K	1¼-King.	Ben.	Bosch	Own	Cotta	Sl. G.	.....	.....	.....	.....	12½	915	3000	3	1½-3¾	2¼	S. G.	Op.	.....	103
104	K	1¼-King.	Ben.	Dixie	Own	Cotta	Sl. G.	.....	.....	.....	.....	12½	810	2850	3	1½-3¾	2¼	S. G.	Op.	.....	104
105	K	1½-King.	Ben.	Dixie	Own	Own	Sl. G.	.....	.....	.....	.....	12½	840	2749	2	2.4-3¾	2.4	S. G.	Op.	.....	105
106	K	2 -King.	Ben.	Bosch	Own	Own	Sl. G.	.....	.....	.....	.....	24	525	3310	2	2-4½	2	S. G.	Op.	.....	106
107	G	1 -King.	Ben.	Dixie	Full.	Full.	Sl. G.	Modine	.....	Timk.	Timk.	10	850	2200	3	1¾-4¾	2½	I. G.	In.	Yes	107
108	G-K	1½-Opt.	Opt.	Dixie	.....	Own	Sel.	Splitex	Own	Own	Own	18	950	.....	2	2-3	2½-3	I. G.	.....	Yes	108
109													700								109
110													490								110
111	G-K	1½-Strom.	Ben.	Dixie	.....	Own	.....	Modine	Hyatt	Hyatt	Hyatt	12	850	2669	1	2½	2½	I. G.	.....	Yes	111
112	K	1⅜-King.	.....	Dixie	Own	Own	Sl. G.	Todd	Hyatt	Hyatt	Own	12	950	2985	1	2½-3	3	S. G.	In	Yes	112
113	G	1½-Strom.	Ben.	Eise.	B. & B.	Own	Sel.	Bremer	Hyatt	N. D.	N. D.	12	900	2600	3	1¾-4½	2½	I. G.	.....	.....	113
114	G-K	1¼-King.	Ben.	Dixie	Own	Own	.....	Perfex	Hyatt	Own	Own	14	600	600	2-2½	1¾-3	2½	.....	.....	Yes	114
115	K	1½-Ben.	Ben.	Dixie	Twin	Nutt.	Sl. G.	Perfex	Timk.	Timk.	Timk.	11	900	2600	2.6-3.8	2-4	2.6	S. G.	In.	Yes	115
116	G-K	-Ben.	Ben.	Simms	B. & B.	.....	Sl. G.	.....	.....	.....	Gurney	Hyatt	9	10 0	2300	2	2½-5	2½	I. G.	.....	Yes	116
117	K	1½-Scheb.	.....	Dixie	Own	Own	Sl. G.	Modine	Hyatt	.....	Hyatt	14	750	2750	2¼-3	2¼-3	2¼-3	S. G.	In.	Yes	117
118	G	1¼-King.	.....	Dixie	Full.	Fuller	Sl G.	Ideal	.....	.....	Timk.	12	900	.....	3	2-5	3	I. G.	In.	Yes	118
119	K	1½-Strom.	Ben.	Eise.	B. & B	Foote	Sl. G.	Perfex	Hyatt	.....	.....	16	600	2600	2	1½-4	2½	S. G.	In.	.....	119
120	D	1¼-Ens.	Donald	Bosch	B. & B.	Own	Sl. G.	Own	Hyatt	.....	Hyatt	12	700	2200	3	1.5-4	2.08	B. P.	.....	.....	120
121	D	-Strom	Donald.	Bosch	Para.	Own	Sl. G.	Own	Hyatt	.....	Hyatt	10-14	700	1835	2	2.06-3.28	2.06	I. G.	.....	.....	121

One- and Two-Horse Tractors

122	G	⅞-King.	Ben.	.....	B. & B.	Own	Sl. G.	Own	Gurney	Own	Own	10	1000	260	1	1½-2.4	2.4	.....	.....	Yes	122
123	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	123
124	G-K	¾-King.	.....	K-W	Own	Own	Sl. G.	Own	Hyatt	Own	Own	12	780	2450	3	1½-4¼	2⅛	S. G.	Op.	.....	124
125	G-K	¾-King	.....	K-W	Own	Own	Sl. G.	Own	.....	Own	Hyatt	12	780	2450	3	1½-4¼	2⅛	S. G.	Op.	.....	125
126	G	¾-King.	Donald.	Heinze	Own	Own	.....	S-J	.....	None	None	4½	850	900	1	¾-3	2	G.	.....	Yes	126
127	G	⅞-Zen.	.....	A-K	Own	Own	.....	Main	.....	.....	.....	6	1000	.....	1	1-3	2	Worm	.....	.....	127
128	K	⅞-King.	Ben.	A-K	Own	Own	Sl. G.	Cand.	.....	.....	.....	.....	1200	.....	1¼-4	.....	.....	Ch.	Op.	.....	128
129	K	1¼-King.	Ben.	.....	Own	Own	Own	Hopper	.....	Own	Own	10	1000	2600	1	1¾-2½	2½	.....	.....	Yes	129
130	G	1½-Vierac	Ben.	Berl.	Own	Own	Spec.	.....	.....	Timk.	.....	6	2000	.....	1	1½-2½	2½	Worm	.....	.....	130
131	G	¾-King.	Own	Eise.	Own	Own	.....	Modine	Fafnir.	.....	.....	4½	1200	1200	1	2½	2¼	I. G.	In.	.....	131
132	K	¼-Ben	Ben.	Dixie	B. & B	Own	Sl. G.	S-J	Hyatt	Hyatt	Hyatt	12	1000	3100	2	2½-4½	2	I G.	In.	Yes	132
133	G	⅞-King	Ben.	Eise.	Own	Own	Sl. G.	B. & W.	Opt.	.....	Hyatt	8	1200	2400	2	1-3½	3½	S. G.	In.	.....	133

Motor Cultivators

134	G-K	¾-King.	.....	K-W	Own	Own	Sl. G	Own	Hyatt	Own	Own	12	780	2450	3	1½-4¼	2⅛	S. G.	Op.	.....	134
135	G	⅞-King.	Ben.	Dixie	B. & B.	.....	.....	Perfex	.....	Hyatt	Hyatt	.....	.....	.....	2	2½-3 7/16	.....	Ch.	.....	.....	135
136	G	⅞-King.	Ben.	Dixie	B. & B.	.....	.....	Perfex	.....	Hyatt	Hyatt	.....	.....	.....	2	2½-3 7/16	.....	Ch.	.....	.....	136
137	G	1¼-Strom.	Own	Bosch	Own	Own	Sl. G.	Own	Hyatt	Own	Own	8	885	1800	2	1-3	2⅛	B. G.	In.	.....	137
138	G	-Holl.	Ben.	Dixie	Own	None	None	Perfex	Hyatt	Own	Hyatt	7⅛	995	.....	1-5	1½-3½	None	.....	.....	.....	138
139	G	⅞-King	Ben.	E. & D.	Own	Own	Sl. G.	B. & W.	.....	.....	Hyatt	8x6	1200	2400	2	1-3½	.....	B. G.	In.	.....	139
140	G	¾-King.	Own	Eise.	B. & B.	Own	Sel.	Modine	S. K. F.	Hyatt	Hyatt	6	1000	1570	2	1.3-3.5	.....	S. G.	In.	.....	140

Associated Manufacturers; Auto., Automatic; Weid., Weidley; Clim., Climax; Twin, Twin City; Cont., Continental; Ruten., Rutenber; Over., Overland; Kingston; Holl., Holley; Scheb., Schebler; Ben., Bennett; Web., Webster; Zeph., Zephyr; Ens., Ensign; Strom., Stromberg; Till., Tillotson; Zen., Zenith; Eisemann; Berl., Berling. Clutch—B. &B., Borg & Beck; Bierman; Mun., Muncie; Rock., Rockwood; spec., special. Gearset—B. & B., Brown & Sharpe; gear; Cr., chain; D. R., double reduction; B. G., bull gear. Drive—Op., open; In., inclosed.

Specifications of the Electrical Equipment Found on 1920 Passenger Cars

Make and Model	IGNITION			GENERATOR		MOTOR		BATTERY			Wiring System	Units Combined	FUSES		
	System	Make	Control	Make	Voltage	Make	Voltage	Make	Amp. Hr.	Voltage			Type	Volts	Amp.
Allen 43	Single	Conn	Hand	A-L	6	A-L	6	Prest-O-L	80	6	1	GI	GT	6	15
American B	Single	Conn	Hand	West	6	Remy	6	Willard	90	6	1	S	3-A	1.250	20
Anderson All	Single	Remy	Hand	Remy	6	West	6	Willard	90	6	1	S	SAE	6	5
Apperson All	Single	Remy	Hand	Bijur	6	Bijur	6–8	Willard	108	6	1	S	Open	1.250	10
Argonne 4		Eisemann	Hand	West	12	West	12	Exide	100	12	1			12	20
Auburn 6–39	Single	Remy	Hand	Remy	6	Remy	6	Willard	80	6	1	S		6–8	25
Beggs 19-T & 19-R		Conn	Hand	A-L	6	A-L	6	Willard	80	6	1	GT	Cart	6	15
Biddle B-1 & B-5	Single	Simms	Hand	G & D	6	G & D	6	Willard	90	6	1	S	GT	6	10
Bour-Davis 20	Single	Remy	Hand	Remy	6	Remy	6	Willard	103	6	1	S	GT	6	15
Brewster	Single	Berling	Hand	U. S. L	12	U. S. L	12				1				
Briscoe 4–34	Single	Conn	Hand	A-L	6	A-L	6	Prest-O-L	80	6	1	GI	GT	6	20
Buick	Single	Delco	Hand	Delco	6	Delco	6	U. S. L	80	6	1	S			
Cadillac 59	Single	Delco	H. & A.	Delco	6	Delco	6	Exide	130	6	1	GM			
Case V-20	Single	West	H. & A.	West	6	West	6	Willard	117½	6	1	GI	5AGT	50	105
Chalmers 35-C	Single	Remy	Hand	A-L	6	A-L	6	Prest-O-L	106	6	1	GI		6	151
Champion KO	Single	Delco	Hand	Dyneto	6	Dyneto	6	Willard	90	6	1	S	GT	6	200
Chandler All	Single	Bosch	Hand	G & D	6	G & D	6	Prest-O-L	105	6	1	S	GT	6	
Chevrolet All	Single	Remy	Hand	A-L	6	A-L	6	Willard	80	6	1	GI	GT	6	
Cleveland 40	Single	G & D	Hand	G & D	6	G & D	6	Prest-O-L	94	6	1	S	GT	6	
Cole All	Single	Delco	H & A	Delco	6	Delco	6	Prest-O-L	50	6	1	S			
Columbia All	Single	At-Kent	Hand	A-L	6	A-L	6	Prest-O-L	80	6	1	S			
Comet C-53	Single	Wagner	Hand	Wagner	6	Wagner	6	Willard	75	6	1				
Crow-Elkhart L-55	Single	Conn	Hand	Dyneto	6	Dyneto	6	Exide	120	6	1		Cart	6	10
Cunningham V-3	Single	Delco	H & A	West	6	West	6	Willard	120	6	1				
Daniels 8-D	Single	Delco	H & A	Delco	6	Delco	6	Willard	140	6	1	S			
Davis 51	Single	Bosch	Hand	Delco	6	Delco	6	Willard	80	6	1	S			
Dixie Flyer	Single	Conn	Hand	Dyneto	6	Dyneto	6	Willard	6–80		2				
Dodge Brothers	Single	Own	H & A	N. E	12	North East	12	Willard	50	12	1	GM	Encl	1–50	10
Dorris 6–80	Single	Bosch	Hand	West	6	West	6	Willard	115	6	1	S	GT	5–8	15
Dort 15	Single	Conn	Hand	West	6	West	6	U. S. L	85	6	1	S		6	10
du Pont A	Single		H & A	West	6	West	6	Exide	115	6	1				
Economy 6–46	Single	Own	Hand	A-L	6	A-L	6	Willard	90	6					
Elcar All	Single	Delco	Hand	Delco	6	Delco	6	Willard	90	6	1	S	GT	6–8	20
Elgin K	Single	Wagner	Hand	Wagner	6	Wagner	6	Willard	90	6	1		GT	6–8	20
Essex A	Single	Delco	H & A	Delco	7	Delco	6	Exide	105	6	1	S			
Ferris				L-N		L-N									
Ford T*	Single	Own	Hand	Own	6	Own		Opt	80	6	1	S			
Franklin 9-B	Single	At-Kent	Auto	Dyneto	12	Dyneto		Willard	60	12	2	GM	GT	14	10
Gardner O	Single	West	Hand	West	6	West	6	Willard	90	6	1	S	GT	6	20
Geronimo		Delco		Dyneto	6	Dyneto	6	Willard	88	6	1	S			
Grant H	Single	At-Kent	Hand	Bijur	6	Grant-W	6	Prest-O-L	105	6	1	S	2GT	6–8	15
Hanson 45-A	Single	Remy	Hand	A-L	6	A-L	6	Prest-O-L	80	6	1		Cart	6	3
Harroun	Single	Remy	Hand	Remy	6	Remy	6	Prest-O-L	80	6	1				
Harvard 4–20		At-Kent		Wagner	6	Wagner	6	Nat. Carb			1	S			
Hatfield A		Conn		Dyneto	6	Dyneto	6	Willard	100	6	1	GI			
Haynes All	Single	Opt	Hand	Leece-N	6	Leece-N	6	Willard	120	6	2	GI	GT	6	5
H. C. S. Special		Delco		Delco		Delco									
Hollier 206-B	Single	R & B	Hand	West	12	West	6	U. S. L	80	6	1	S	GT	6	20
Holmes	Single	Eisemann	Auto	Dyneto	12			Willard	100	12	2	S	GT	15	15
Hudson Super-Six	Single	Delco	H & A	Delco	7	Delco	7	Exide	105	6	1	GM			
Huffman	Single	Conn	Hand	Dyneto	6	Dyneto	6	Willard	80	6	1	S		6	25
Hupmobile R	Single	At-Kent	Hand	West	6	West	6	Willard	87½	6	1	S	Encl	6	10
Jackson 6–38	Single	Remy	Hand	A-L	6	A-L	6	U. S. L	94	6	1	GI	GT	6–8	15
Jones All	Single	Remy	Hand	A-L	6	A-L	6	Prest-O-L	120	6	1	GI	GT	6	20
Jordan F	Single	Delco	Hand	Delco	6	Delco	6	Willard	108	6	1	S	C. B		
Jordan M	Single	Delco	Hand	Delco	6	Delco	6	Willard	94	6	1	S	C. B		
King 8	Single	At-Kent	Hand	West	6	West	6	Prest-O-L	120	6	1	S	Cart	6	10
Kissel	Single	Remy	Hand	Remy	6	Remy	6	Willard	117.5	6	1	S	3 A. G	6	20
Kline 6–55–J	Single	Conn	Hand	Wagner	6	Wagner	6	Prest-O-L	80	6	1	S	5 A. G	6	
LaFayette	Double	Delco	H & A	Delco	6	Delco	6	Exide	120	6		GM		6	
Leach		Remy		West											
Lexington S-20	Single	Conn	Hand	G. & D	6	G. & D	6	Willard	100	6	1		GT	6	15–5
Liberty 10-C	Single	Wagner	Hand	Wagner	6	Wagner	6	Willard	90	6	1	GI			
Locomobile 48–6–7	Dual	Berling	Hand	West	6	West	6	Exide	150	6	1	S	G. T	6	10
Lorraine	Single	West	Hand	West	6	West	6	U. S. L	94	6	1	S	GT		

ABBREVIATIONS: *Starting and Lighting in closed models only. Ignition: *At-K*, Atwater-Kent; *Conn.*, Connecticut; *West*, Westinghouse; *Auto*, Automatic; *H. & A*, Hand and Automatic; *S. A.*, Semi-Automatic. Generator: A-L, Auto-Lite; *G & D*, Gray & Davis; *Leece-N*, Leece-Neville; *Ward-L.*, Ward-Leonard; *N. E.*, North East; *Split*, Splitdorf. Motor: *A-L*, Auto-Lite, *G & D*, Gray & Davis; *Leece-N*, Leece-Neville; *West*, Westinghouse.

Giving Ignition, Starting, Lighting, Battery, Lamp, Spark Plug and Horn Data

LAMP CANDLEPOWER, VOLTAGE AND TYPE OF BASE									SPARK PLUGS			Horn	Make and Model
	HEADLIGHTS		SIDELIGHTS		TAILLIGHTS		DASHLIGHT						
Base Contact	Volts	CP.	Volts	CP.	Volts	CP.	Volts	CP.	Make	Diam. Inches	Thread Pitch		
Single	6-8	18	*6-8	5	6-8	2	6-8	2	Champion	7/8	18	Klaxon	Allen 43
Single	6-8	15	*6-8	5	3-4	2	3-4	2	Bethlehem	7/8	18	Sparton	American B
Single	6-8	21	6-8	4	6-8	4	6-8	4	A. C.	7/8	18	Klaxon	Anderson All
Double	6-8	18	*6-8	4	d6-8	2	d6-8	2	A. C.	7/8	18	Sparton	Apperson All
Single	12	21	12	6	12	2	12	2	A. C.	7/8	18	Klaxon	Argonne 4
Single	6-8	15	*6-8	4	6-8	2	6-8	2	Rajah	7/8	18	E. A.	Auburn 6-39
Single	6-8	21	6-8	4	3-4	2	3-4	2	Champion	7/8	18	Trojan	Beggs 19-T & 19R
Single	6-8	21	*6-8	4	6-8	2	d6-8	2	Splitdorf	7/8	18	Klaxon	Biddle B-1 & B-5
Single	6-8	15	6-8	5	6-8	2	6-8	2	A. C.	7/8	18	E. A.	Bour-Davis 20
Single	12	36	12	4	6-8	2	d6-8	2	Herz-Boug	7/8	18	Klaxon	Brewster
Single	6-8	21			6-8	2	d6-8	2	Champion	7/8	18	Sparton	Briscoe 4-34
Single	6-8	15	6-8	4	6-8	2	6-8	2	A. C.	7/8	18	Stewart	Buick
Single	7	18	8	6	4	2	3-4	2	Titan	7/8	18	Delco	Cadillac 59
Single	6-8	21	6-8	4	6-8	2	6-8	2	A. C.	7/8		Klaxon	Case V-20
Single	6-8	15	*6-8	4	6-8	2	6-8	2	A. C.	7/8	18	Schwarze	Chalmers 35-C
Single	6-8	15			6-8	2	6-8	2	Champion	7/8	18	Garford	Champion KO
Single	6-8	15	6-8	4	6-8	2	6-8	2	A. C.	7/8	18	Klaxon	Chandler All
Single	6-8	21	6-8	4	6-8	2	d6-8	4	A. C.	7/8	18	Klaxon	Chevrolet All
Single	6-8	17	6-8	4	6-8	2	6-8	2	A. C.	7/8	18	Trojan	Cleveland 40
Single	6-8	21	*6-8	5	6-8	4	d6-8	5	A. C.	7/8	18	Sparton	Cole All
Single	6-8	15	*6-8	4	6-8	2	d6-8	2	Champion	7/8	18	Schwarze	Columbia All
Single	6-8	18			6-8	2	6-8	4	Champion	7/8	18	Klaxon	Comet C-53
Single	6-8	15	6-8	4	6-8	2	6-8	2	Champion	7/8	18	E. A. Lab.	Crow-Elkhart L-55
Single	6-8	21	6-8	4	6-8	2	6-8	2	Champion	7/8	18	Sparton	Cunningham V-3
Single	6-8	21	6-8	4	6-8	2	d6-8	2	A. C.	7/8	18	Klaxon	Daniels 8-D
Single	6-8	21			6-8	2	6-8	2	A. C.	7/8	18	Klaxon	Davis 51
Double	6-8	15			d3-4	2	d3-4	2	Champion	7/8	18	Garford	Dixie Flyer
Single	12-16	15			12-16	2	12-16	2	A. C.	7/8	18	Klaxon	Dodge Brothers
Single	6-8	21	6-8	4	6-8	2	6-8	2	Opt	7/8	18	Klaxon	Dorris
Single	6-8	15			6-8	2	d6-8	2	A. C.	7/8	18	Schwarze	Dort 15
Single	6-8	21	6-8	4	6-8	2	6-8	2	A. C.	7/8	18	Klaxon	du Pont A
Single													Economy 6-46
Single	6-8	21	6-8	4	6-8	2	6-8	2	Champion	7/8	18	E. A. L.	Elcar All
Single	6-8	17			6-8	2	6-8	2	Champion	7/8	18	E. A. L.	Elgin K
Single	6-8	15			3-4	2	*3-4	2	A. C.	18 m.m.	1.5 m.m.	Sparton	Essex A
													Ferris
Double	6-8	17	6-8	2	6-8	2			Champion	1/2	pipe	Own	Ford T
Double	12-16	21	*12-16	4	6-8	2	6-8	2	Opt	7/8	18	Klaxon	Franklin 9-B
Single	6-8	15			6-8	2	6-8	2	Champion	7/8	18	Trojan	Gardner G
Single	6-8	21			6-8	2	6-8	2	Champion	7/8	18	Trojan	Geronimo
Single	6-8	15	6-8	4	6-8	2	6-8	2	Champion	7/8	18	Trojan	Grant H
Single	6-8	15			6-8	2	6-8	2	Champion	7/8	18	Schwarze	Hanson 45-A
Single	6-8	15			3-4	2	d3-4	2	A. C.			Schwarze	Harroun
	6-8		3-4		3-4		*3-4			7/8	18		Harvard 4-20
Single	6-8	15	*4-8	4	6-8	4	6-8	2	A. C.	7/8	18	Ecco	Hatfield A
Double	6-8	15	*6-8	12	d6-8	2	6-8	2	A. C.	7/8	18	Klaxon	Haynes All
													H. C. S. Special
Single	6-8	15	6	4	3-4	2	3-4	2	A. C.	7/8	18	Sparton	Hollier 206-B
Double	12-16	30			6-8	2	6-8	2	Bethlehem	7/8	18	Klaxon	Holmes
Single	6-8	15	6-8	4	3-4	2	*3-4	2	A. C.	7/8	18	Sparton	Hudson Super Six
													Huffman
Single	6-8	15	6-8	2	6-8	2	6-8	2	A. C.	7/8	18	Trojan	Hupmobile R
Single	6-8	15	6-8	4	3-4	2	3-4	2	Champion	7/8	18	Stewart	Jackson 6-38
Double	6-8	15	*6-8	4	s6-8	2	s6-8	2	Champion	7/8	18	Newtone	Jones
Single	6-8	18	*6-8	4	6-8	3	6-8	3	A. C.	7/8	18	Sparton	Jordan F
Single	6-8	18	6-8	4	6-8	3	6-8	3	A. C.	7/8	18	Sparton	Jordan M
Single	6-8	15	*6-8	4	6-8	2	6-8	2	Champion	7/8	18	Sparton	King 8
Double	6-8	18			d6-8	2	d6-8	2	A. C.	7/8	18	Sparton	Kissel
Single	6-8	15			6-8	2	d6-8	2	Champion	7/8	18	Klaxon	Kline 6-55-J
	6-8	21	6-8	6	3-4	4	3-4	2		7/8	18	Klaxon	Lafayette
													Leach
Single	6-8	21	6-8	4	6-8	2	d6-8	4	Bethlehem	7/8	18	E. A. L.	Lexington S-20
Single	6-8	15	*6-8	4	6-8	2	d6-8	2	A. C.	7/8	18	United	Liberty 10-C
Single	6-8	21	6-8	6	6-8	4	6-8	2	Titan	7/8	18	Klaxon	Locomobile 48-6-7
Single	6-8	17			6-8	2	6-8	2	A. C.	7/8	18	Schwarze	Lorraine

Battery: *Prest-O-L*, Prest-O-Lite. **Wiring system:** *GI*, Generator and Ignition combined; *GIM*, Generator, Ignition, Motor combined; *S*, Generator, Motor Ignition separate; *GM*, Generator and Motor combined. Fuses: *GT*, Glass Tube: *Cart*, Cartridge; *C. B.*, Circuit Breaker. Lamps: *Dashlights in series with Taillights; headlight contains sidelight; d,—double contact; s,—single contact.

Specifications of the Electrical Equipment Found on 1920 Passenger Cars

Make and Model	IGNITION			GENERATOR		MOTOR	BATTERY				Wiring System	Units Combined	FUSES		
	System	Make	Control	Make	Voltage	Make	Voltage	Make	Amp. Hr.	Voltage			Type	Volts	Amp.
Maibohm.....B	Single	At-Kent	Hend	Bijur	6	Bijur	6	Willard	94	6	1	S.	2-A	6	20
Marmon.....34	Single	Delco	Auto	Delco	6	Delco	6	Willard	162	6	1	GI.	Cart		
Maxwell.....25	Single	At-Kent	Hand	Simms-Huff	12	Simms-Huff	12	Prest-O-L.	35	12	1	GM.	Cart	12	20
McFarlan..... 127	Double	Opt	Hand	West	6	West	6	Willard		6	1	GI.	5 A. G	6	
Mercer.....Ser. 5	Single	Berling	Hand	West	6	West	6	Willard	90	6	1	S.	Cart		10
Meteor.....KR	Single	Simms	Hand	Bijur	6	Bijur	6	Willard		6					
Metz, Master Six	Single	Conn	Hand	West	6	West	6	Willard	120	6	1				
Mitchell.....F-40	Single	Remy	Hand	Remy	6	Remy	6	Willard	100	6	1	S.	GT	6	10
Monitor	Single	Conn	Hand	Dyneto	6	Dyneto		Prest-O-L.	110	6	1				
Monroe.....S-9	Single	Conn	Hand	A-L	6	A-L	6	U. S. L.	80	6	1				
Moon.....6-48	Single	Wagner	Auto	Delco	6	Delco	6	Exide	120	6	1	S.			
Moon.....6-68	Single	Delco	Auto	Delco	6	Delco	6	Exide	120	6	1	S.			
Moore.....F	Single	Conn	Hand	A-L	6	A-L	6	Willard	80	6	2				
Nash	Single	Wagner	H & A	Delco	6	Wagner	6	Willard	100	6	1	S.			
National...Series BB	Single	Delco	H & A	West	6	West	6	Prest-O-L.	110	6	1	S.	GT	6-8	5
Nelson.....D	Single	Bosch	Hand	U. S. L.	12	U. S. L.	12	Willard	72	12	2	S.	G	12	5-30
Noma.....1-B	Single	Delco	Hand	Delco	6	Delco	6	Willard	104	6					
Oakland.....34-B	Single	Remy	Hand	Remy	6-8	Remy	6	Prest-O-L.	85	6-8	1	GI.			
Ogren.....6-60	Single	Bosch	Hand	West	6	West	6	Willard	120	6	1		Cart	6	10
Oldsmobile.....37-A	Single	Remy	Hand	Remy	6	Willard	6	Remy	80	6	1				
Oldsmobile.....45-B	Single	Delco	Hand	Delco	6	Delco	6	Willard	80	6	1				
Olympian.....45	Single	Conn	Hand	A-L	6	A-L	6	U. S. L.		6					
Overland.....4	Single	Conn	Hand	A-L	6-8	A-L	6	U. S. L.	75	6-8	1	GI.	Glass	6	20
Packard.....3-35	Single	Delco	H & A	Bijur	6	Bijur	6	Willard	120	6	1	S.	GT	6	10
Paige.....All	Single	At-Kent	H & A	G & D	6	G & D	6	Willard	108.4	6	1	S.	G		20
Pan-American.....All	Single	At-Kent	Hand	West	6	West	6	Willard	100	6	1	S.	G	6	
Paterson.....6-47	Dual	Delco	Hand	Delco	6	Delco	6	Willard	110	6	1				
Peerless.....Ser. 6	Single	At-Kent	H & A	A-L	6	A-L	6	Willard		6	1				30
Piedmont.....4-30	Single	Delco	Hand	Dyneto	6	Dyneto	6	Willard	90	6	1	S.			
Piedmont.....6-40	Single	Remy	Hand	Remy	6	Remy	6	Willard	90	6	1	S.			
Pierce-Arrow..38&48	Double	Delco	H & A	West	6-8	West	6	Willard	150	6	1	S.	5 A. G	6-8	
Pilot.....6-45	Dual	Delco	Hand	Delco	6	Delco	6	Prest-O-L.	80	6	1	GI.			
Porter.....46	Dual	Berling	Hand	West	12	West	12	Prest-O-L.	118	12	1	S.	Cart	12	15
Premier.....6-D	Single	Delco	Hand	Delco	6	Delco	6	Willard	123.5	6	1	S.			
Reo.....T & U	Single	North East	Hand	North East	6	North East	6	Willard	108.5	6	2	GI.	Wire	6	5
Reo.....T 6& U6	Single	North East	Hand	North East	6	North East	6	Willard	108.5	6	1	S.	Wire	6	6
Revere	Single	Bosch	Hand	West	6	West	6	Willard	120	6	1	S.	GT	6	15
Roamer.....6-54	Single	Bosch	Hand	Bijur	6	Bijur	6	Columbia	117	6	1	S.	3A	6	10
R & V Knight...J & R	Dual	Wagner	Hand	Wagner	6	Wagner	6	Willard	117	6	1	S.	Cart	250	20
Saxon.....125	Single	Remy	Hand	Wagner	6	Wagner	6	Prest-O-L.	80	6	1	S.	Cart	6-8	15
Sayers.....C.P.	Single	Delco	Hand	Delco	6	Delco	6	Willard	80	6	1	GI.	C.B.		
Scripps-Booth.....B	Single	Remy	Hand	Remy	6	Remy	6	Prest-O-L.	85	6	1	GI.	GT	6	20
Seneca.....H-2	Single	Conn	Hand	Allis Chal.	6	Allis Chalm		Prest-O-L.	88	6	1	GM.			20
Singer.....20	Single	Bosch	Hand	West	6	West	6	Willard	115	6	1	S.	G. C		5& 10
Skelton.....35		Conn	Hand	West	6	West	6	Prest-O-L.	85	6	1				
Spacke.....S-20															
Standard.....8-I	Double	Dixie	Hand	West	6	West	6	Willard	160	6	1	S.W.	2-A	6	15
Stanley.....735				Remy	6			Willard	100	6	1	G.	Cart	6	20
Stearns.....SKL-4	Single	At-Kent	Hand	West	12	West	12	Willard	61.5	12	1	S.			20
Stephens.....80	Single	Conn	Hand	A-L	6	A-L	6	U. S. L.	116	6	1	S.	Cart	6	20
Stevens-Duryea															
Studebaker.....All	Single	Wagner	Hand	Wagner	6-8	Wagner	6	Willard	115	6-8	1	S.	Cart	6	10
Stutz.....H	Double		Hand	Remy	6	Remy	6	Willard		12	1				
Templar.....445	Single	Simms	Hand	Bijur	6	Bijur	6	Columbia	100	6	1	S.		6	20
Tulsa.....E-1,2,3	Single	Delco	Hand	Dyneto	6	Dyneto	6	Exide	90	6	1	S.	GT	6	15
Velie.....48	Single	At-Kent	S. A.	Bijur	6	Bijur	6	Willard	120	6	1	S.	Wire		15
Westcott...C-38&C-48	Single	Delco	H & A	Delco	6	Delco	6	Willard	120	6	1	S.	CB		
Willys-Knight....88-4	Single	Conn	Hand	A-L	6-8	A-L	6	U. S. L.	120	6	2	GI.	GT	6	15
Winton Six.....24	Single	Bosch	Hand	Bijur	6	Bijur	6	Willard	120	6		S.	GT	6	15
Winton Six.....25	Single	Bosch	Hand	Bijur	6	Bijur	6	Willard	139	6	1	S.	CB	6	15
Winther.....61	Single	West	Hand	West	6	West	6	Willard	127	6		S.	GI.	6	10
Wolverine	Single	Bosch	Hand	Bijur		Bijur	6	Prest-O-L.	120	6	1	S.	CB	6	15

ABBREVIATIONS: *Starting and Lighting in closed models only. Ignition: *At-K*, Atwater-Kent; *Conn.*, Connecticut; *West*, Westinghouse; *Auto*, Automatic; *H. & A*, Hand and Automatic; *S. A.*, Semi-Automatic. Generator: A-L, Auto-Lite; *G & D*, Gray & Davis; *Leece-N*, Leece-Neville; *Ward-L.*, Ward-Leonard; *N. E.*, North East; *Split*, Splitdorf. Motor: *A-L*, Auto-Lite, *G & D*, Gray & Davis; *Leece-N*, Leece-Neville; *West*, Westinghouse.

Giving Ignition, Starting, Lighting, Battery, Lamp, Spark Plug and Horn Data

LAMP CANDLEPOWER, VOLTAGE AND TYPE OF BASE									SPARK PLUGS			Horn	Make and Model
Base Contact	Headlights Volts	Headlights CP.	Sidelights Volts	Sidelights CP.	Taillights Volts	Taillights CP.	Dashlight Volts	Dashlight CP.	Make	Diam. Inches	Thread Pitch		
Single	6-8	20	6-8	4	6-8	2	6-8	2	Champion	7/8	18	Schwarze	Maibohm B
Single	6-8	30	*6-8	9	6-8	2	6-8	2	A. C.	7/8	18	Sparton	Marmon 34
Double	12-16	15	*12-16	4	12-16	2	12-16	2	Champion	7/8	18	Schwarze	Maxwell 25
Single	6-8	21	*6-8	12	6-8	2	d6-8	2	A. C.	7/8	18	Klaxon	McFarlan 127
Single	6-8	21	6-8	5	6-8	5	6-8	4	Champion	7/8	18	Sparton	Mercer Ser. 5
Single	6-8		6-8		6-8		6-8						Meteor K R
Single	6-8	16	6-8	4	6-8	2	6-8	2	Champion	7/8	18	Trojan	Metz, Master Six
Single	6-8	15			s6-8	2	6-8	2	A. C.	7/8	18	Sparton	Mitchell F-40
									Champion	7/8	18	Klaxon	Monitor
Double	6-8	16			6-8	2	6-8	2	Champion	7/8	18	Trojan	Monroe S-9
Single	6-8	20			6-8	2	d6-8	2	Champion	7/8	18	Klaxon	Moon 6-48
	6-8	20			6-8	2	d6-8	2	Champion	7/8	18	Klaxon	Moon 6-68
Single	6-8	20	6-8		6-8	2			Champion	7/8	18	Garford	Moore F
Single	6-8	15	*6-8	4	6-8	2	d6-8	2	A. C.	7/8	18	Trojan	Nash
	6-8	20	*6-8	4	6-8	2	6-8	2	A. C.	7/8	18	Sparton	National Series BB
Double	12-16	15	12-16	4	12-16	2	12-16	2	Champion	7/8	18	Schwarze	Nelson D
Single	6-8				6-8		d6-8						Noma 1-B
Single	6-8	15			6-8	2	6-8	2	A. C.	7/8	18	Schwarze	Oakland 34-B
Single	6	32	6		6	4	6	4	Champion	7/8	18	Klaxon	Ogren 6-60
Single	6-8	15	6-8	4	6-8	2	6-8	2	A. C.	7/8	18	Klaxon	Oldsmobile 37-A
Single	6-8	15	*6-8	4	6-8	2	6-8	2	A. C.	7/8	18	Klaxon	Oldsmobile 45-B
									Champion			E. A. Lab.	Olympian 45
Single	6-8	16			3-4	2	*3-4	2	Champion	1/2		A. L.	Overland 4
Single	6-8	33	*6-8	4	6-8	2	6-8	2	A. C.	7/8	18	Sparton	Packard 3-35
Single	6-8	17	6-8	4	6-8	2	d6-8	2	A. C.	7/8	18	Trojan	Paige All
Single	6-8	32			6-8	2	*3-4	4	Champion	7/8	18	E. A. Lab.	Pan-American All
Single	6-8	15	6-8	4	6-8	2	6-8	2	A. C.			E. A. Lab.	Paterson 6-47
Single	6-8	15	6-8		6-8	2	6-8	4	A. C.			Sparton	Peerless Ser. 6
Single	6-8	12			6	2	6	2	Champion	7/8	18	Klaxon	Piedmont 4-30
Single	6-8	12			6	2	6	2	Champion	7/8	18	Klaxon	Piedmont 6-40
Single	6-8	20			6-8	5	6-8	5	A. C.	7/8	18	Klaxon	Pierce-Arrow 38&48
Single	6-8	15			6-8	2	6-8	2	A. C.	7/8	18	Schwarze	Pilot 6-45
Single	12-16	20	12-16	4	12-16	4	12-16	2	Champion		18	Stewart	Porter 46
Double	6-8	21	*6-8	4	6-8	2	d6-8	2	A. C.	7/8	18	Klaxon	Premier 6
Double	6-8	15			3-4	2	*3-4	2	A. C.	7/8	18	Trojan	Reo T & U
Single	6-8	15			6	2	*3-4	2	A. C.	1/2		Klaxon	Reo T6 & U6
Single	6-8	20	*6-8	8	6-8	4	6-8	4	Rajah	7/8	18	Klaxon	Revere
Single	6-8	15	*6-8	2	6-8	2	d6-8	2	A. C.	7/8	18	Sparton	Roamer 6-54
Single	6-8	15	6-8	4	6-8	2	d6-8	4	A. C.	7/8	18	Klaxon	R & V Knight J. & R.
Single	6-8	15			6-8	2	6-8	2	A. C.	7/8	18	Trojan	Saxon 125
Single	6-8	15			6-8	2	d6-8	2	Champion	7/8	18	Stewart	Sayers C. P.
Single	6-8	18			6-8	2	6-8	2	A. C.	7/8	18	Opt	Scripps-Booth B
Single	6-8	15	6-8	2	6-8	2	d6-8	2	A. C.	7/8	18	Fitzgerald	Seneca H-2
Single	6-8	15		4	6-8	2	d6-8	2	A. C.	7/8	18	Klaxon	Singer 20
	6	18			6	2	6	2	Bethlehem	7/8	18	E. A. Lab.	Skelton 35
													Spacke S-20
Double	6-8	21	6-8	4	6-8	2	6-8	2	A. C.	7/8	18	Klaxon	Standard 8-I
Double	6-8	21	6-8	4	6-8	2	6-8	2				Klaxon	Stanley 735
Single	12-16	21	*12-16	4	12-16	2	12-16	2	A. C.	7/8	18	B.&A.Lab.	Stearns SKL-4
Single	6-8	15	6-8	2	6-8	2	6-8	2	Champion	7/8	18	Trojan	Stephens 80
													Stevens-Duryea
Single	6-8	12			6-8	2	6-8	2	Champion	1/2		Sparton	Studebaker All
Double	6-8	15	*6-8	4	6-8	2	6-8	2	A. C.			Klaxon	Stutz H
Single	6-8	21	*6-8	4	6-8	2	6-8	2	Champion	7/8		Klaxon	Templar 445
Single	6-8	21	6-8	2	6-8	2	d6-8	2	Champion	7/8	18	Trojan	Tulsa E-1,2,3
Single	6-8	15	6-8	4	6-8	4	d6-8	4	Champion	7/8	18	Sparton	Velie 48
Single	6-8	18	*6-8	4	3-4	2	d3-4	2	A. C.	7/8	18	Klaxon	Westcott C-38&C-48
4 S-D2	6-8	21	6-8	4	3-4	2	*3-4	2	Champion	7/8	18	Opt	Willys-Knight 88-4
Single	6-8	17	6-8	7	6-8	2	6-8	2	Champion	7/8	18	American	Winton Six 24
Single	6-8	17	6-8	7	6-8	2	6-8	2	Champion	7/8	18	Electric	Winton Six 25
Single	6	18			6	4	6	2	A. C.	7/8	18	Klaxon	Winther 61
Single	6-8	32	6-8	7	6-8	2	6-8	2	A. C.	7/8	18	Klaxon	Wolverine

Battery: *Prest-O-L*, Prest-O-Lite. Wiring system: *GI*, Generator and Ignition combined; *GIM*, Generator, Ignition, Motor combined; *S*, Generator, Motor Ignition separate; *GM*, Generator and Motor combined. Fuses: *GT*, Glass Tube: *Cart*, Cartridge; *C. B.*, Circuit Breaker. Lamps: *Dashlights in series with taillights; headlight contains sidelight; d,—double contact; s,—single contact.

Motor Age Farm-Lighting Specification Tables

Name and Model	Maker	Watts Capacity	No. 20 watt lamps	Lamp voltages	No. cyl'ds	No. cycles	Make of engine	Horsepower	Fuel	Cooling	Power pulley	Generator drive	Make of generator	Make of battery	Battery amp. hours	Battery, volt	No. cells	Starting engine	Stopping engine	Governor type	Price
Aerothrust	Aerothrust Engine Co., La Porte, Ind	....	15–25	....	2	2	.....	3	.....	Air	Opt.	Shaft	.....	.....	60	28–42	.....	.....	.....	Throttle	.....
Alamo	Alamo Farm Light Co.; Omaha, Neb	1000	75–120	40	1	4	Ida	2	.....	Water	.....	Direct	.....	.....	.....	.....	16	.....	.....	Throttle	$ 525
Cushman, A	Cushman Motor Works, Lincoln, Neb	1000	20–70	32	1	4	Own	4	G	Water	Yes	Belt	Imperial	Universal	80	32	16	S-Auto.	S-Auto.	Throttle	575
C		1000	25–75	32	1	4	Own	4	G	Water	Yes	Belt	Imperial	Universal	120	32	16	S-Auto.	S-Auto.	Throttle	650
E		1000	50–100	32	1	4	Own	4	G	Water	Yes	Belt	Imperial	Universal	180	32	16	S-Auto.	S-Auto.	Throttle	959
Delco Lt., ¾ KW, 32-volt	Domestic Engineering Co., Dayton, Ohio	750	37	32	1	4	Own	1½	Opt.	Air	No	Direct	Own	Exide	160	32	16	Auto.	Auto.	Voltage	475–545
3 KW, 32-volt		3000	150	32	1	4	Own	5	Opt.	Air	No	Direct	Own	Exide	80–160	32	16	Manual	Auto.	Throttle	1295–1602
3 KW, 110-volt		3000	150	110	1	4	Own	5	Opt.	Air	No	Direct	Own	Exide	80–160	112	56	Manual	Auto.	Throttle	385
Dyneto, 5	Dyneto Electric Co., Syracuse, N. Y	600	10–42	32	1	4	Novo	1½	.....	Water*	Opt.	Belt	Own	Willard	53	32	16	S-Auto.	S-Auto.	Throttle	410
7		....	16–54	32	1	4	Novo	1½	.....	Water	Opt.	Belt	Own	Willard	80	32	16	S-Auto.	S-Auto.	Throttle	460
9		....	23–65	32	1	4	Novo	1½	.....	Water	Opt.	Belt	Own	Willard	110	32	16	S-Auto.	S-Auto.	Throttle	585
L-4-F-7		1250	16–66	....	1	..	New Way	4	G	Air	Yes	Chain	Own	Willard	80	32	16	S-Auto.	S-Auto.	Throttle	440–560
Evreltie	St. Paul Electric Co., St. Paul, Minn	1000	50–100	32	1	4	Own	3	G & K	Water	Yes	Direct	West.	Phila.	95–275	32	16	S-Auto.	Auto.	Voltage	.....
Fairbanks-Morse, F-1½-	Fairbanks-Morse & Co., Chicago	600	40	32	1	4	Own	1½	K	Water	Yes	Belt	Own	.....	.....	36	16	S-Auto.	Manual	Throttle	.....
F-3-65		900	65	32	1	4	Own	3	K	Water	Yes	Belt	Own	.....	120	32	16	S-Auto.	Manual	Throttle	.....
F-3-100		1500	100	32	1	4	Own	3	K	Water	Yes	Belt	Own	.....	160	32	16	S-Auto.	Manual	Throttle	.....
F-6		3500	200	32	1	4	Own	6	K	Water	Yes	Belt	Own	.....	200	32	16	S-Auto.	Manual	Throttle	.....
Fairmont, B-4	Fairmont Gas E. & R. M. Co., Fairmont, Minn	....	50	32	1	2	Own	4	G & K	Water	Yes	Belt	W. E.	Edison	80	32	24	S-Auto.	Manual	Throttle	595
Garford	Garford Mfg. Co., Elyria, Ohio	600	16–62	30	..	..	Any	2	.....	.....	.....	Belt	.....	Gould	80	32	11	.....	Manual	.....	320
Geneo, A	General Gas-Electric Co., Hanover, Pa	1000	22–73	32	1	4	Own	2½	Any	Water	Yes	Direct	Own	Own	110	32	16	S-Auto.	Auto.	.....	.....
B		1000	36–87	32	1	4	Own	2½	Any	Water	Yes	Direct	Own	Own	167	32	16	S-Auto.	Auto.	.....	.....
Hercules-Sunbeam	Sunbeam Electric Mfg. Co., Evansville, Ind	650	33	32	1	4	Own	1½	G	Water	Yes	Direct	Own	U. S. L.	80	28	14	S-Auto.	Auto.	Electro-mag.	345
Holt Power-Light, 110-volt	Automatic Light Co., Inc., Ludington, Mich	750	30	110	1	4	Own	2	G	Water	.....	Direct	Own	Columbia	86	6	3	.....	Auto.	Electro-sole	450
Jupiter, 3	Perfection Storage Battery Co., Chicago	600	27	32	1	4	Opt.	2	K	Water	Yes	Belt	Own	Own	80	32	16	S-Auto.	S-Auto.	Throttle	*335
6		1600	67	60	1	4	Opt.	4	K	Water	Yes	Belt	Own	Own	80	60	32	S-Auto.	S-Auto.	Throttle	*610
Lalley Light	Lalley Light Corp., Detroit	1000	50	32	1	2	Own	2	G	Water	.....	Direct	.....	Willard	115	32	16	Manual	S-Auto.	Throttle	550
Lauson-Edison, 201	John Lauson Mfg. Co., New Holstein, Wis	800	7–30	50	1	4	Opt.	2½	Opt.	Water	Opt.	Belt	Own	Edison	38	50	26	Manual	Manual	Throttle	.....
202-30		400	16–50	50	1	4	Opt.	2½	Opt.	.....	Opt.	Belt	.....	Edison	75	52	26	Manual	Manual	Throttle	.....
206-110		3500	27–154	25	1	4	Opt.	4½	Opt.	.....	Opt.	Belt	.....	Edison	38	.....	94	Manual	Manual	Throttle	.....
Lauson Junior, 300		500	10–25	30	1	4	Opt.	1½	Opt.	.....	Opt.	Belt	Own	.....	40	30	15	Manual	Manual	Throttle	.....
301		800	15–40	30	1	4	Opt.	1½	Opt.	.....	Opt.	Belt	Own	.....	60	30	15	Manual	Manual	Throttle	.....
Langstadt-Meyer, B-1½	Langstadt-Meyer Co., Appleton, Wis	1500	75–160	32	1	4	Own	3	G & K	Water	Yes	Direct	Own	Willard	80–160	32	16	S-Auto.	Manual	Throttle	.....
6		600	30–45	32	1	4	L-M	3	G	Water	Yes	Belt	L-M	Willard	80	32	16	S-Auto.	Manual	Throttle	.....
6½		1200	75	32	1	4	L-M	3	G	Water	Yes	Belt	L-M	Willard	80	32	16	S-Auto.	Manual	Throttle	.....
7		1200	100	32	1	4	L-M	3	G & K	Water	Yes	Belt	L-M	Willard	107	32	16	S-Auto.	Manual	Throttle	.....
Main, Type XX	Main Electric Co., Cleveland	250	12	32	1	4	Own	1½	Opt.	Water	Yes	Belt	Own	Own	40	32	16	Manual	Manual	Throttle	250
MAF		500	25	30	1	4	Own	1½	Opt.	Water	Yes	Belt	Own	Own	60	30	15	Manual	Manual	Throttle	325
1-BF		800	40	30	1	4	Own	3	Opt.	Water	Yes	Belt	Own	Own	80	30	15	Manual	Manual	Throttle	550
2-DF		100	50	30	1	4	Own	3	Opt.	Water	Yes	Belt	Own	Own	130	30	15	Manual	Manual	Throttle	615
Marco	Marmon-Chicago Co., Chicago	1250	85–100	32	1	4	New Way	4	Opt.	Air	Yes	Chain	Dyneto	Perf't'n	.....	32	11	S-Auto.	.....	Electro-mag.	595
Matthews, A-1	Matthews Engineering Co., Sandusky, Ohio	1000	50	32	1	4	Own	3	G	Water	No	Direct	G-E	Willard	80	32	16	S-Auto.	Auto.	Electro-mag.	.....
B		1000	100	32	2	4	Own	7	G	Water	No	Direct	G-E	Willard	144	32	16	Auto.	Auto.	Electro-mag.	1,350
B-1		2000	100	32	2	4	Own	7	G	Water	No	Direct	G-E	Willard	144	32	16	S-Auto.	Auto.	Electro-mag.	1,250
C		5000	250	110	4	4	Own	...	G	Water	No	Direct	G-E	.....	.....	.....	.....	.....	Auto.	Electro-mag.	.....
Mayhew, K-1	Mayhew Co., Milwaukee, Wis	800	12–40	32	1	4	.....	...	G	Water	Yes	Direct	Western	.....	80	32	16	S-Auto.	Manual	Flyball	475
K-2		800	16–48	32	1	4	.....	...	G	Water	Yes	Direct	Western	.....	125	32	16	S-Auto.	Manual	Flyball	510
K-3		800	22–54	32	1	4	.....	...	G	Water	Yes	Direct	Western	.....	160	32	16	S-Auto.	Manual	Flyball	550
National, 1-K	National Elec. Lighting Co., Wilton Junction, Ia	1000	50	32	1	..	New Way	5½	G & K	Air	Yes	Chain	G-E	Victor	160	32	16	.....	Auto.	Throttle	550
1½-K		1500	75	32	1	..	New Way	5½	G & K	Air	Yes	Chain	G-E	Victor	160	32	16	.....	Auto.	Throttle	550
Owen	R. M. Owen & Co., New York	1280	64	32	1	4	Own	3½	G	Water	.....	Direct	.....	.....	80	32	16	S-Auto.	Auto.	Flyball	.....
Perfection, SA-1	Perfection Storage Battery Co., Chicago	1200	50	32	1	4	Own	3½	A-G-K	Water	Yes	Direct	Dyneto	Own	80	32	16	Auto.	Auto.	Voltage	550
SA-6		1200	50	65	1	4	Own	3½	A-G-K	Water	Yes	Direct	Dyneto	Own	80	32	16	Auto.	Auto.	Voltage	615
SA-10		1200	50	110	1	4	Own	3½	A-G-K	Water	Yes	Direct	Dyneto	Own	80	32	16	Auto.	Auto.	Voltage	825
Powerlite, 163-L-66	Montgomery Ward & Co., Chicago	1000	50–85	32	1	4	Own	3	G & K	Water	Yes	Direct	Own	Prest-O-L	80–120	32	16	S-Auto.	Auto.	.....	438
163-L-72		1000	50–120	32	1	4	Own	3	G & K	Water	Yes	Direct	Own	Prest-O-L	160-240	32	16	S-Auto.	Auto.	.....	508
163-B-81		1000	50–85	32	1	4	Own	2½	Any	Water	Yes	Belt	Imperial	Prest-O-L	80–120	32	16	S-Auto.	Manual	Throttle	343
Rohaco, Unit	Roberts-Hamilton Co., Minneapolis, Minn	1500	75	32	1	4	Own	3	Opt.	Water	Yes	Direct	.....	Opt.	75–200	32	16–24	S-Auto.	Manual	Flyball	.....
BE-1		800	50–120	32	1	4	Own	2	Opt.	Water	Yes	Belt	.....	Prest-O-L	75–120	32	16–24	S-Auto.	Manual	Flyball	*500
BE-2		1500	75	32	1	4	Own	3	Opt.	Water	Yes	Belt	.....	Prest-O-L	.....	32	16–24	S-Auto.	Manual	Flyball	*600
Sunnyhome	Sunnyhome Electric Co., Detroit, Mich	1250	62	110	1	4	Own	2½	G	Oil	No	Direct	Own	U. S. L.	36	110	52	Auto.	Auto.	.....	645
Swanlite	Black Swan Co., Waseca, Minn	1000	50–100	....	1	4	Own	3	Opt.	Water	No	.....	.....	.....	60–160	32	16	.....	.....	.....	.....
Swartz, Unit	Swartz Electric Co., Indianapolis, Ind	1000	50	30	1	2	Own	...	G	Water	No	Direct	Own	Opt.	88–160	32	16	S-Auto.	Manual	Electro-mag.	.....
E		1500	50	30	1	4	Own	...	G & K	Water	Yes	Belt	Own	Opt.	88–210	32	16	S-Auto.	Manual	Flyball	.....
F		2000	100	60	1	4	Own	5	G & K	Water	Yes	Belt	Own	Opt.	88–210	64	32	S-Auto.	Manual	Flyball	.....
G		2500	125	110	1	4	Own	5	G & K	Water	Yes	Belt	Own	Opt.	44–160	110	56	S-Auto.	Manual	Flyball	.....
Syco	Beaudette & Graham Eng. Co., Boston, Mass	1000	62–70	32	1	4	Own	3	G	Water	Yes	Direct	.....	.....	90–160	32	16	S-Auto.	S-Auto.	Throttle	.....
Uni-Electric, 1-KW	Uni-Lectric Corp., Detroit, Mich	1000	50	110	1	..	Own	...	G	Water	No	Direct	Roth	Willard	.....	6	3	S-Auto.	S-Auto.	Voltage	563.50
Universal, 1-KW	Universal Products Co., Oshkosh, Wis	1000	75–120	32	1	4	Own	...	G	Water	.....	Direct	Own	.....	90–130	32	16	S-Auto.	Auto.	.....	495
4-KW		4000	200	32	1	4	Own	...	G	Water	.....	Direct	Own	.....	130	32	.....	S-Auto.	Auto.	.....	975
M		1000	75–100	32	1	4	Own	...	G	Water	No	Direct	K-R	Globe	120-165	32	16	S-Auto.	Auto.	Throttle	530
West. Elect., 15-DC-90	Western Electric Co., New York	1500	75	32	1	..	Own	3¼	K	Air	Yes	Direct	Own	.....	90	32	16	S-Auto.	Auto.	Throttle	.....
15-DC-180		1500	100	32	1	..	Own	3¼	K	Air	Yes	Direct	Own	.....	180	32	16	S-Auto.	Auto.	Throttle	.....
Willys Light	Electric Auto-Light Corp., Toledo, Ohio	750	85	32	1	4	Knight	2	K	Air	No	Direct	A-L	Exide	225	32	16	S-Auto.	Auto.	.....	525
Winton	Winton Engine Works, Cleveland, Ohio	5000	250	115	4	4	Own	...	.....	Water	.....	Direct	Own	Opt.	Opt.	Opt.	Opt.	.....	.....	.....	.....
Wisconsin, 15-Light	Lauson, Lawton Co., De Pere, Wis	450	12	30	1	..	Own	2½	.....	Water	Yes	Belt	Own	.....	36	26	13	Manual	Manual	.....	.....
30-light		600	24	32	1	..	Own	2½	.....	Water	Yes	Belt	Own	.....	36	32	16	Manual	Manual	.....	.....
50-light		800	40	32	1	..	Own	2½	.....	Water	Yes	Belt	Own	.....	60	32	16	Manual	Manual	.....	.....

*Without engine. Opt., Optional. S-Auto., Semi-Automatic. K, Kerosene. G, Gasoline. Electro-mag., Electro-magnetic. A-L., Auto-Light West., Westinghouse.

For Fords, Overlands, Studebakers

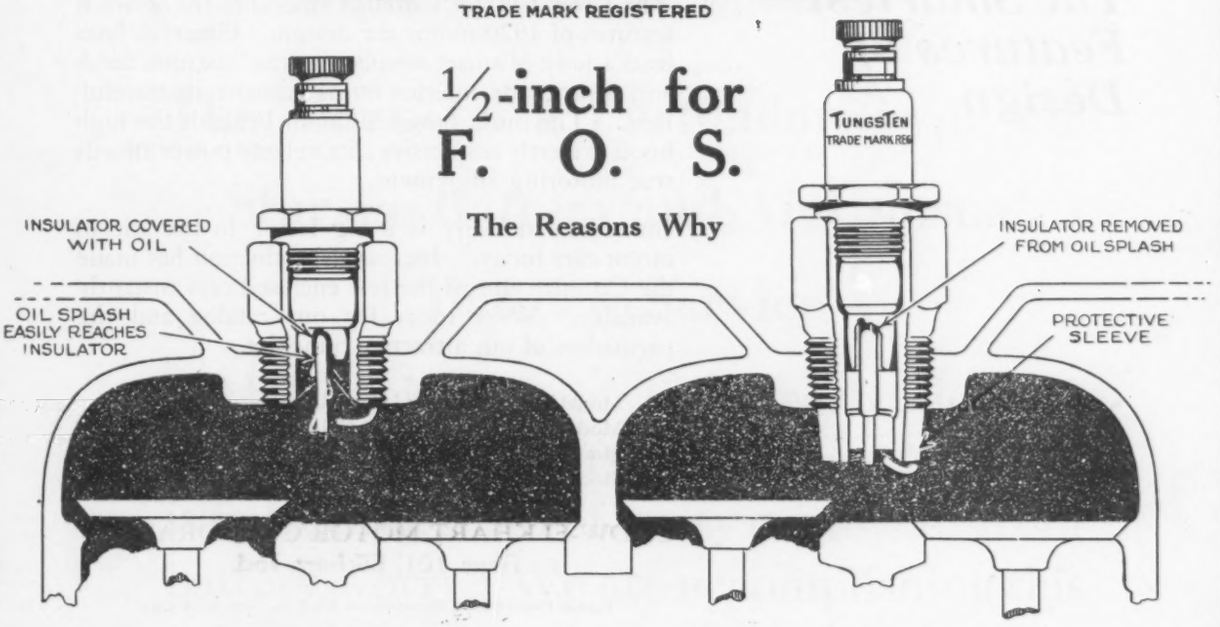
Here's the Answer

TUNGSTEN

TRADE MARK REGISTERED

½-inch for F. O. S.

The Reasons Why



TRY IT at our expense in the worst oil pumping front cylinder you can find

This New Type Tungsten Will Stand More Oil and Carbon Without Shorting Than Any Plug You Have Ever Used and We Will Prove It to You.

READ THE COUPON

OWNER'S COUPON

Tungsten Mfg. Co.,
Marshalltown, Ia.

Send me one of your new Tungsten ½ in. Special F. O. S. prepaid, for which I enclose

$1.00 Currency Stamps

Dealer's name is.....

Name .....

Town..... State.....

TUNGSTEN MFG. CO.

MARSHALLTOWN
IOWA

Attach This To Your Letterhead

DEALER'S COUPON

Tungsten Mfg. Co.,
Marshalltown, Ia.

Send us, without obligation, one of your new Tungsten ½ in. Special F. O. S.

Name .....

Town .....

State .....

CROW-ELKHART
Multi-Powered

The Smartest Features of Design

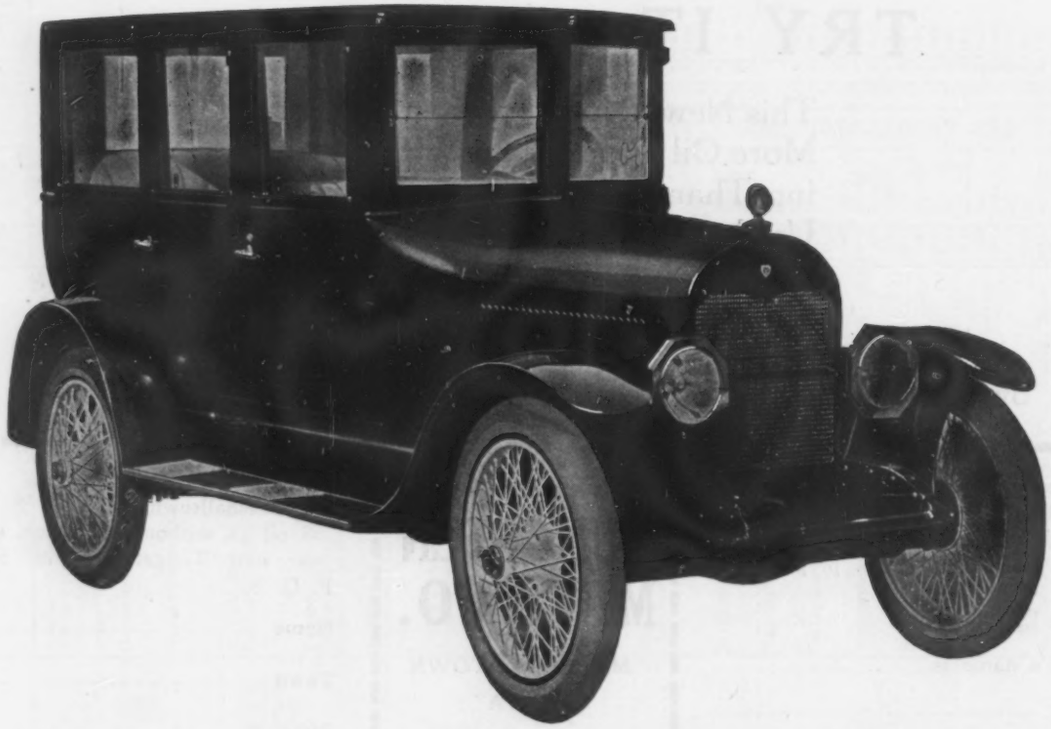
The Crow-Elkhart Cozedan embodies the smartest features of 1920 motor car design. Graceful lines lend a note of smart simplicity; the lustrous finish and appropriate interior fittings denote its tastefulness. The multi-powered motor beneath the high hood is alertly responsive; its velvety power affords true motoring enjoyment.

Immediate delivery is a big factor in the sale of motor cars today. Increased production has made the Cozedan one of the few enclosed cars instantly available. Write today for our catalog and the particulars of our attractive franchise.

Model L-57 Cozedan, Four Cylinder .	**$2195**
Model H-57 Cozedan, Six Cylinder . .	**$2395**
Model H-55 Touring Car, Six Cylinder .	**$1545**
Model L-55 Touring Car, Four Cylinder	**$1295**

CROW-ELKHART MOTOR CORPORATION
Dept. 101, Elkhart, Ind.

Export Department, Broadway at 53rd St., New York City



THE HARTFORD BATTERY MFG. CO.

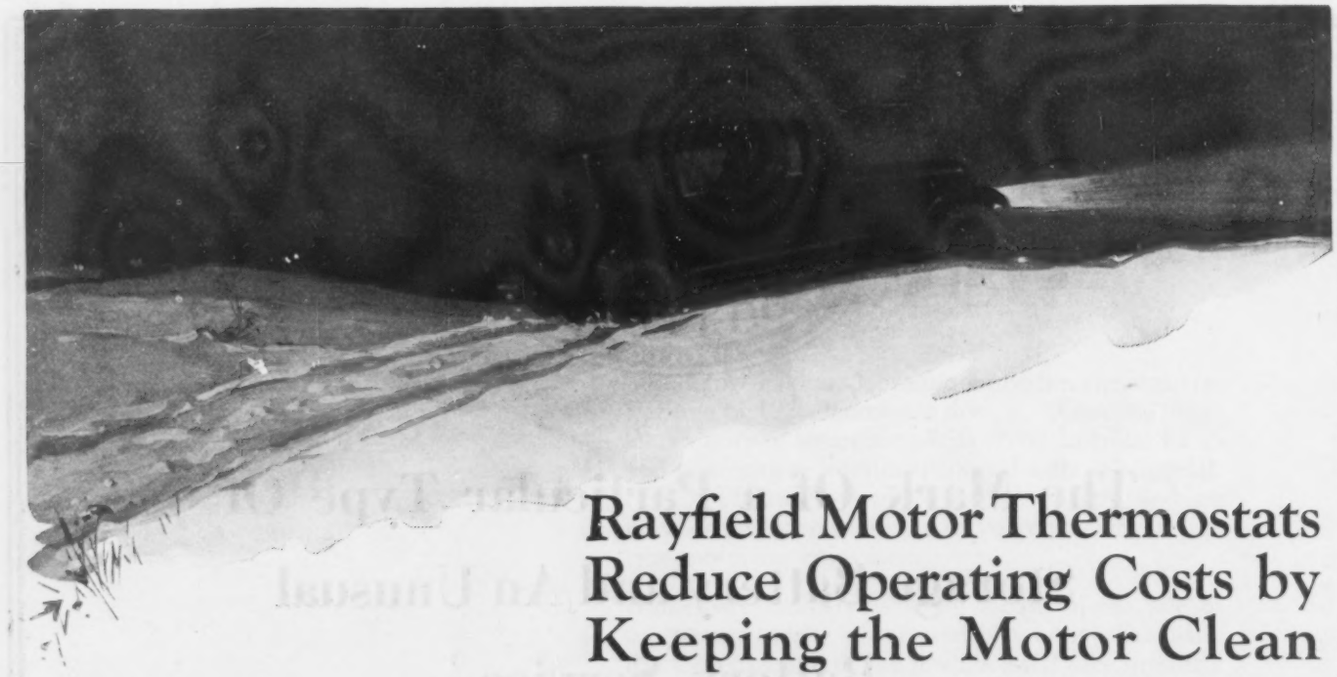
The Mark Of a Particular Type Of Storage Battery and An Unusual Battery Service

THE objective of the clearly defined policy of the Hartford Battery Mfg. Co. is to free the mind of every car owner from battery worry. We are accomplishing this result through two courses: (1) the production of a troubleless battery, and (2) insistence upon Hartford Battery Mfg. Co. service stations being properly equipped and managed to give at all times an actual service of unusual thoroughness.

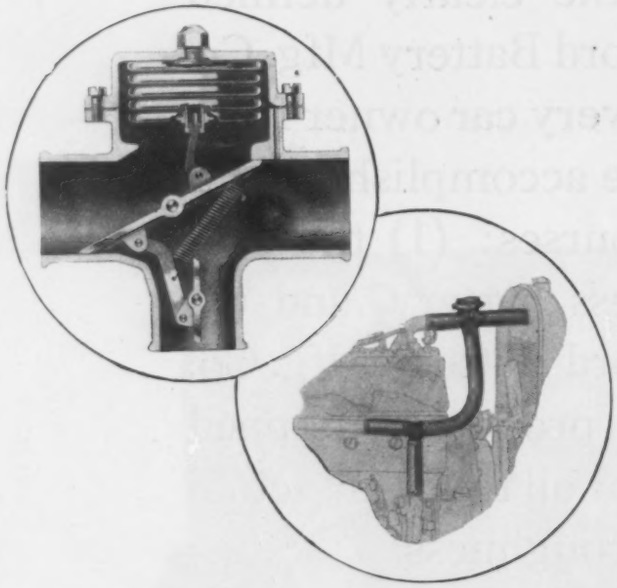
Distributors are constantly being established throughout the United States and Canada. There is at present good territory open for the right distributors. Our battery and service form a combination with a strong sales appeal. If you are interested in a successful battery business and would like territory, write or wire at once.

THE HARTFORD BATTERY MFG. CO.

HARTFORD, CONN.



Rayfield Motor Thermostats Reduce Operating Costs by Keeping the Motor Clean



Rayfield Motor Thermostats, by regulating the circulation of water around the motor block, cause the motor to warm up quickly. This means a smoothly running car in all weathers.

A one-piece diaphragm sensitive to heat and cold controls the operation of the thermostat. The action of the diaphragm operates valves which maintain the temperature at 155° at all times.

This simple, compact device is installed easily on the top pipe connection between the motor block and the radiator. It cannot clog.

Motorists can readily conceive the many advantages to be gained with the motor always operating under an efficient temperature.

Chief among these are increased fuel economy, the elimination of gasoline entering the crank case, the spark plugs and valves being always free from carbon, and added performance through increased power and quicker acceleration.

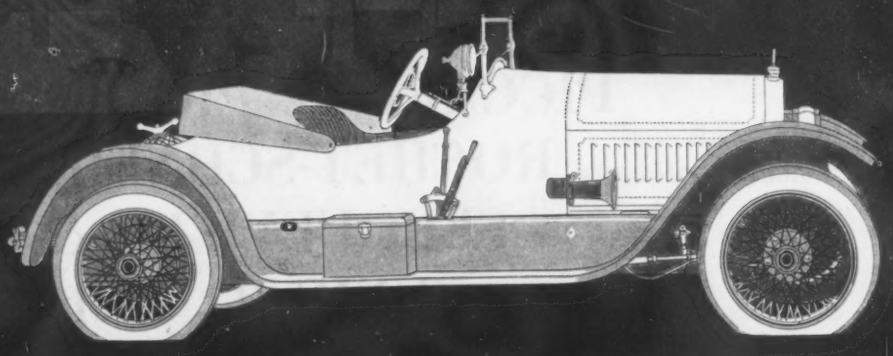
If your dealer hasn't a Rayfield Thermostat in stock, write us direct.

BENEKE & KROPF MANUFACTURING CO.
21st and Rockwell Streets, Chicago, Illinois

(19)

RAYFIELD
MOTOR THERMOSTAT

INDIANAPOLIS
STUTZ
INDIANA, U.S.A.



The Car That Made Good in a Day

This advertisement appeared in La Vie Automobile

POURQUOI la

Suspension Compensee

HOUDAILLE

1920

est-elle adoptee par:

ALBA
ALDA (F. Charron)
CHENARD & WALCKER
DELAGE
DELAUNAY-BELLEVILLE
FARMAN
PANHARD & LEVASSOR
PICCARD & PICTET
ROCHET-SCHNEIDER
SECQUEVILLE & HOYAU
UNIC (G. Richard)
etc., etc.

Il y a certainement une raison...

MAURICE HOUDAILLE, CONSTRUCTEUR, Brevete S. G. D. G.

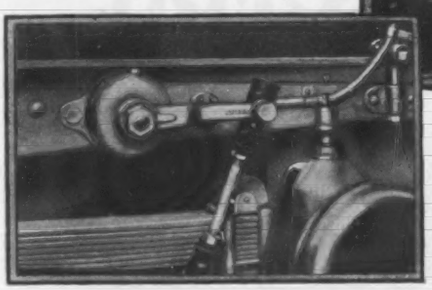
Bureaux et Usines: 50 et 52, Rue Raspail, LEVAULOIS-PERRET

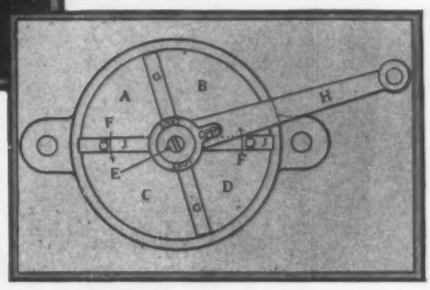
Telephone: WAGRAM 08-06



Crowds visited the Paris auto show every day

The glycerine filled chamber is divided in four sections by two paddles, one stationary—the other free, moving.
When the springs of the car compress the oil will pass from A to C—D to B, but just as the springs start to open the valves FF close and resistance is exerted by paddle G checking the quick opening or violent action of the spring.
A turn of a set screw makes permanent adjustment. It's easy—simple.





"There is a tendency to fit shock absorbers—*Houdaille being prominent on French cars"

**Taken from a report on the Paris automobile show appearing in a leading automobile journal.*

THE stamp of approval placed on Houdaille Hydraulic Suspension by the car manufacturers and leading engineers of France is the result of years of satisfactory service of this suspension on such cars as——

DeLaunay-Belleville, Panhard, Delage, Unic, Alba, Farman, Rochet-Schneider.

When war broke out, the Houdaille was installed on a vast number of ambulances and service cars—and on 10 cars for Marshal Foch.

The ambulances so equipped were picked to bring in the seriously injured men. Drivers say that riding over rough roads—no roads—in cars equipped with Houdaille Hydraulic Suspensions saved many a boy's life.

And on the mountainous Italian front Houdaille-equipped cars did especially good work.



Thousands of Houdailles are in use

Not only in France are motorists enjoying the easy-riding comfort that Houdaille Suspensions afford—but English and American manufacturers are now adopting the Houdaille. The opposite page is an exact duplicate of page advertisement used by the originator.

It is the correct Principle of Suspension

The Houdaille checks the spring rebound—absorbing the shocks before they reach those in the car—moving always with equal and entire freedom on the compression; they exert the degree of resistance you desire when the spring starts to open.

There's but one moving part which operates in glycerine-filled chambers—one simple adjustment—no springs to break or lose tension—no joints to rattle.

When installed on cars the Houdaille is practically invisible—it does not spoil the lines, the beauty of fine cars.

HOUDAILLE (HOO-DIE) HYDRAULIC SUSPENSION

1392 West Ave. Buffalo, N. Y.

DISTRIBUTORS

The Houde Co., 88 First St., Cambridge, Mass.
The Houde Co., 250 W. 54th St., New York City
B. H. Rogers, San Francisco, Calif.
F. E. Cooper, Pittsburgh, Pennsylvania

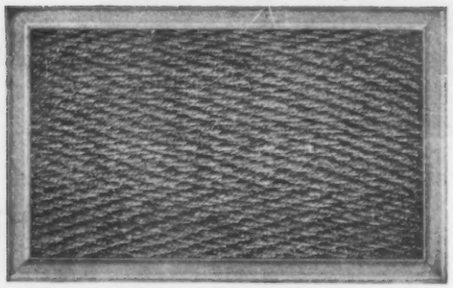


"As Necessary as a Tail-Light"

KokoMat

TRADE MARK REGISTERED U.S. PATENT OFFICE

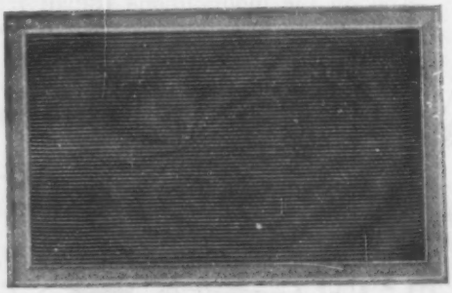
Always clean, never soggy or mushy.



Koko Fibre is held firmly in place by a rustless metal binding rim which prevents wrinkling and holds it tight.



The strong metal back is perforated to allow the mat to dry on the car. Two sturdy ridges prevent sagging, and make a firm footing. The strong, heavy springs are adjustable, and hold the mat tight on any width running-board.



This mat is fitted with the best corrugated rubber held tightly in place with same binding and patented rim as KOKO MAT. The back of the rubber mat is not perforated.

Slips On Any Running Board

STEP on the MAT, and don't track dirt, mud, or slush in the car.

THE KOKO MAT won't sag, or wrinkle, and it will not lap over the edge of the running board.

THE KOKO MAT is made of non-slipping, quick drying fibre—the same material used by the Government on the decks of submarines.

All Mats 11"x14"

List Prices: $1.50 East of the Rockies, $1.75 West and $2.00 in Canada.

The dealer's discounts on this proposition are too liberal to be overlooked. There is not a customer on your books who does not need at least two KOKO MATS—NOW. Don't let the season start without KOKO MATS in your stock.

Write or wire for exclusive territory rights.

Manufactured by KOKO MAT CO., INC.

110 East 23rd Street, New York, N. Y.

Sales Dept.: Mooers-Wright Co., 1400 Broadway, New York

TRADE MARK REGISTERED
EMCO

EMCO TABER

Symbols of Satisfaction

These trade marks are as government notes issued as legal tender for the convenience of a buying public.

They are printed and put in circulation as our security for the value of the products they represent.

The quality and satisfaction behind these Emco trade marks are equivalent to the gold maintained in our government treasury for the redemption of legal tender.

Thousands upon thousands of buyers have accepted Emco trade marks and all have received full value in the products they represent.

As a jobber or dealer you naturally prefer to handle legal tender in order to reduce the risk of loss to a minimum.

Read the four following pages

EMCO MANUFACTURING CO., Inc.

Makers of Dependable Products for the Automobile
42 Court Street, Binghamton, N. Y.

The Quickest Operation, Strongest and Most Secure Tire Carrier for Fords or Chevrolets on the Market

And so it "looks" and "acts" its way into car-owner favor wherever introduced. Emco dealers everywhere will back this statement.

JUST BREAK THE TOGGLE INWARDLY, SLIP ON THE TIRE OR TIRES, THEN PULL THE TOGGLE OUT AND THE JOB IS COMPLETE WITH THE LOCKING DEVICE PLACED SECURELY AGAINST THE RIM.

The toggle joint is the big new feature.

Then in the matter of sturdy construction the Emco leaves nothing to be desired. The very look of the device shows strength and longevity.

Car owners can attach the Emco in ten minutes—no trouble whatever.

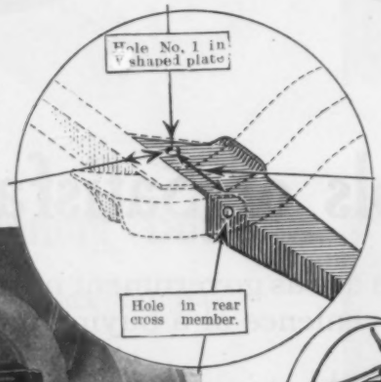
Dealers: It's mighty certain that car owners in your territory will be glad to get rid of that old haphazard method of carrying spare tires. When they can do this and at the same time get an instantly locking and unlocking device—then you know that this advertisement offers you an unusual "quantity" sales opportunity.

Get to know more about it by writing us.

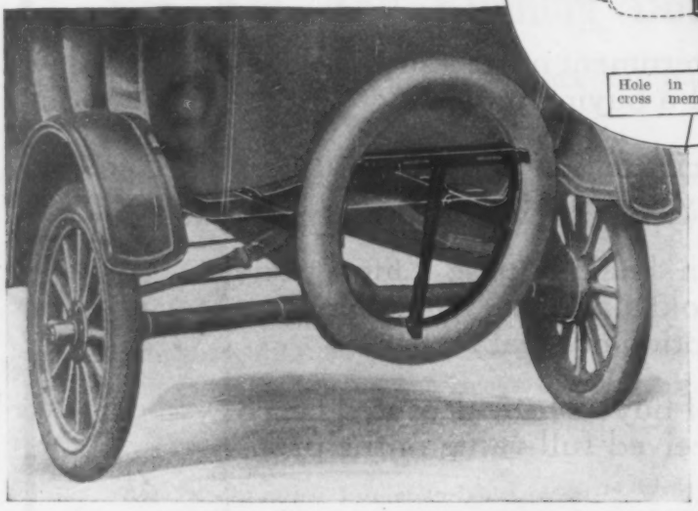
THE EMCO MANUFACTURING CO.
42 Court Street
Binghamton, New York

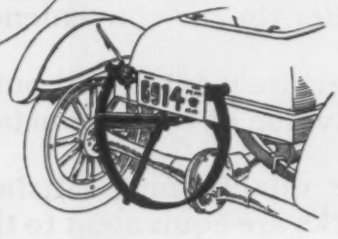
NOTE.—On all Ford Cars sold or produced since July first, 1919, provision is made at the factory for attaching tire carriers. Holes will be found already located as outlined above.

Two inches between outer edge of frame member and No. 1 hole center.

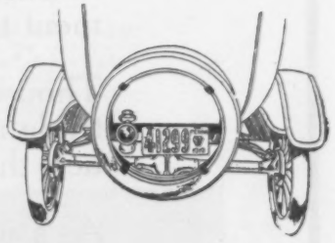


3½ inches between center No. 1 hole to outer or rear side of rear cross member.





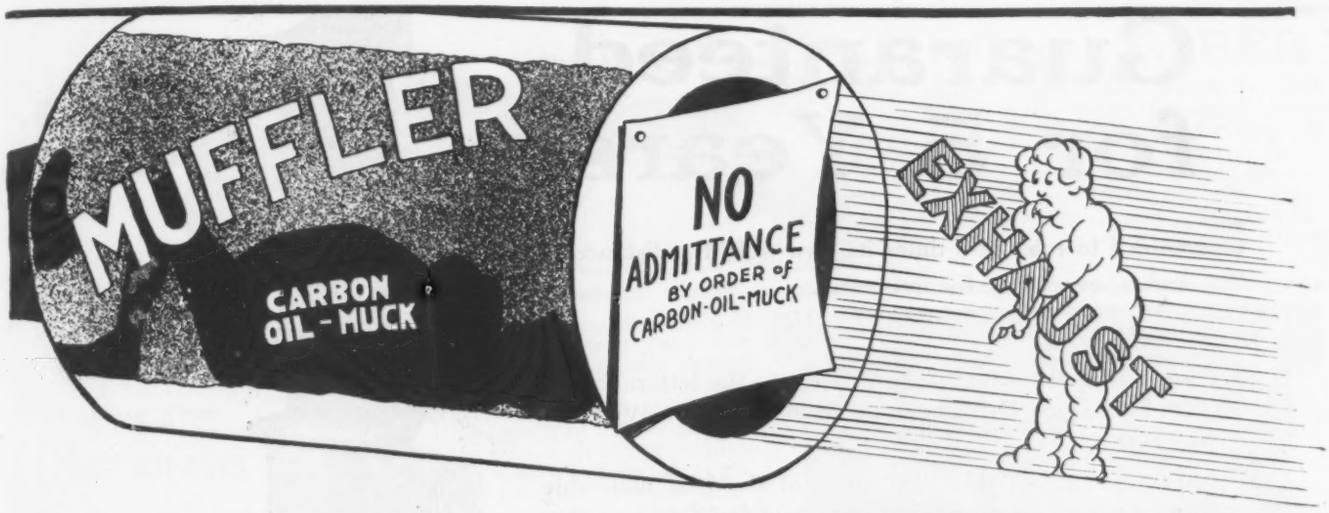
Showing tire in position and carrier locked.



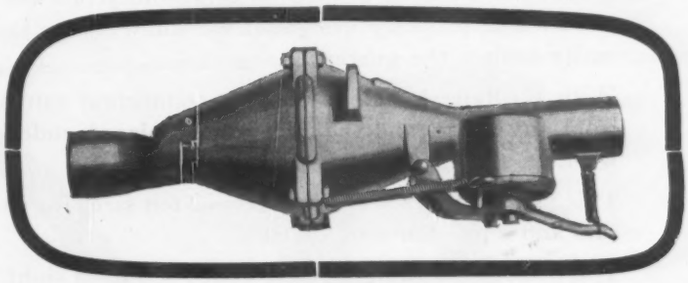
Showing carrier ready to receive tire.

THE EMCO TIRE CARRIER

IT'S ALL IN THE TOGGLE



How The TABER Ousts the Big, Lazy One and Lets the Little Fellow Through!



Explosive gases through the exhaust pass by a cut-out, separated from the muffler, about as fast as an express train goes by a local depot.

The Taber Combined Muffler and Cutout has demonstrated to thousands of car owners that the only logical place for a cutout is within the muffler.

Here is where the explosive gases are slowed down, cooled and silenced. Here, also, is where engine refuse, carbon and oil muck is deposited.

Here is just where the Taber Cutout sings "All out." Engine refuse cannot clog the Taber Muffler, cause backpressure, decrease engine power, increase gasoline and oil consumption and make a nightmare of motoring pleasures.

The six points of Taber efficiency are worth what they bring to the man who buys a Taber—a sweet and clean running motor.

Easily installed and its price is soon saved.

Dealers: Our sales letters will interest every prospect in your territory. You can sell the TABER as a stock item. If big profits and quick turnovers interest you, write or wire an initial order. Don't forget to mention the name of your favorite jobbe. Act now. Don't be satisfied with later profits.

Emco Manufacturing Co.

Makers of Dependable Products for the Automobile

42 Court Street, Binghamton, New York

Six Points for More Peaceful Motoring

1. The Taber Muffler is a solid casting of sturdy construction. Cannot rattle, loosen nor blow out. Nothing to get out of order. No attention, upkeep or expense.

2. Note the business-like, at-the-front position of the Taber Cutout. It's right where a Cutout should be.

3. Self-Cleaning, scissor-like plates of this patented port cutout valve cannot clog. Exit for oil, muck and carbon. Road mud cannot get between these plates.

4. Compensating pin balances all wear on only moving part of the Taber. Keeps cutout valve absolutely gas tight.

5. Note tightness and strength of this seam. It makes an air tight and gas tight joint.

6. After the red-hot gases have gone through the Muffler and have been expanded, cooled and silenced, this tailpipe with its inside straight walls, performs the last rite of slowing them down so that they puff out into the open air in the form of spent gas—utterly lifeless and noiseless.

CHEVROLET (specify if wanted for 1920 car), MAXWELL, BUICK & DODGE Models $5.50, Ford and Fordson Tractor Model $4.85. (Higher West of the Rockies.)

THE TABER BOTH A MUFFLER & CUTOUT

Guaranteed for 5 Years

Guaranteed to raise 500 times its own weight a distance of 7½ inches, every day for five years.

We mean this guarantee to be fulfilled to the letter. Every owner of an Emco Jack understands that he buys five years of jack service.

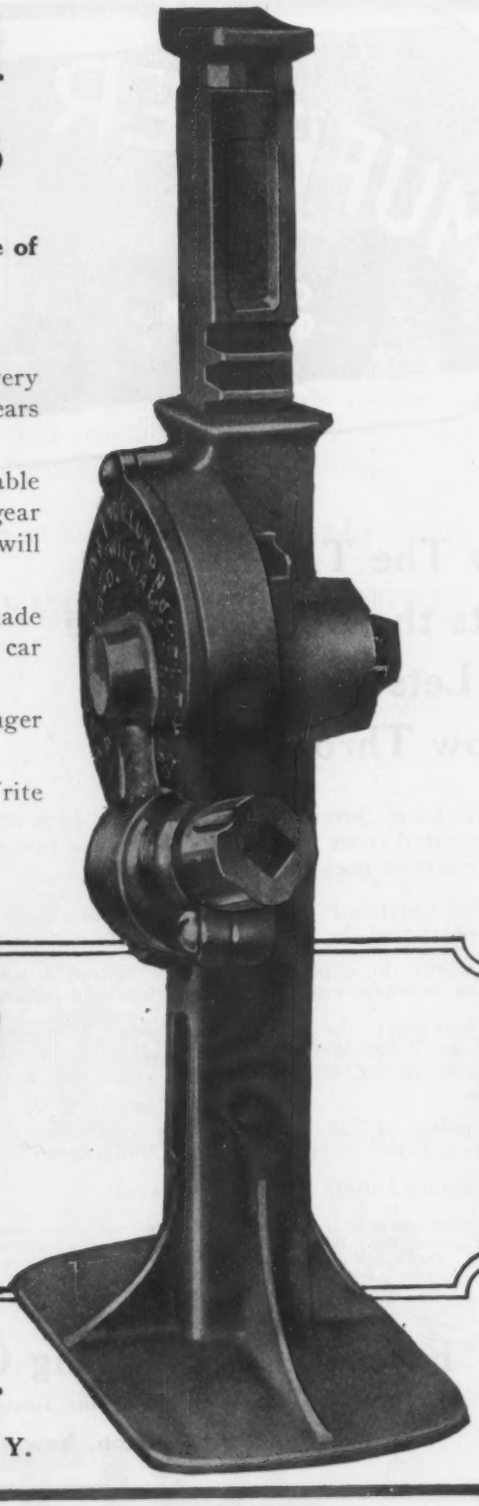
With every part of this jack made of the best malleable iron, no ratchets or chance for slips and jerks, worm gear driven and properly designed, we know these jacks will easily outlast the guarantee.

With the long handle a positive connection can be made from any angle, and the jack can be placed under the car without soiling the hands or clothing.

This jack comes in three sizes, two 2-ton sizes for passenger cars and a five ton size for trucks.

The decided advantages of the Emco sell it on sight. Write for interesting proposition.





Emco Manufacturing Co. Inc.

Makers of Dependable Products for the Automobile

42 Court Street **Binghamton, N. Y.**

THE EMCO SAFETY AUTO & TRUCK JACK

Manufactured Under Special Licence From Norland Novelty Company



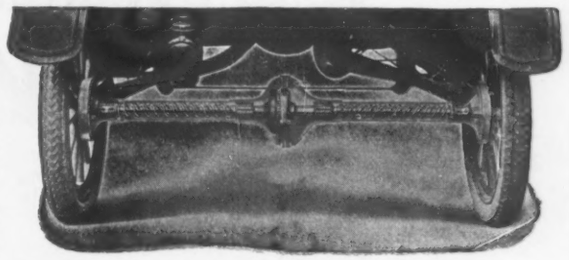
"SOLO" (Ford Type) Muffler Without Cutout

The TABER

For Fords, Chevrolets, Maxwells and Dodges. Reduces Back Pressure; gives more power on less gasoline. Reduces oil consumption and increases mileage. Less noise, more power. Guaranteed against blow-outs for the life of the car. Furnished complete with brackets and full instructions for quick-and-easy installation. Specify Type when ordering. Price $3.85 complete. ($4.00 West of Rockies.)

GREASE RETAINERS

The EMCO Grease Retainers illustrated in position on rear axles. Arrows show how grease is kept moving constantly toward differential. Two centrifugal coiled springs that cure a great evil. They keep oil and grease from dripping out of axle ends, thus keeping brakes free from oil and preventing tire damage. Save money and trouble. Cure unsightly waste of lubricant. Insure longer life to gears. Easily applied. Require no attention or upkeep. Types for Ford and Chevrolet now ready. Price, 50c per pair.





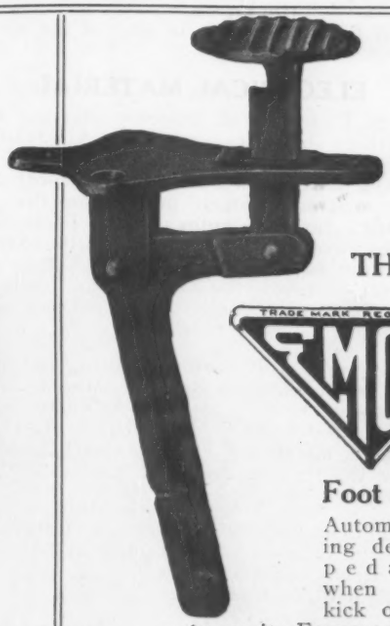
TRADE MARK REGISTERED EMCO

Unlined Brake Shoe for FORDS

In one or two pieces as desired. Sand casted from gray iron. Reinforced at points of greatest wear. Every pain tested to insure perfect fit without waste.

Price per set, complete with springs,

75 cents



THE

TRADE MARK REGISTERED EMCO

Foot Pedal

Automatic locking device holds pedal down when in use—a kick of the heel releases it. Free working joints and countersunk recesses for screws. Note extra long leverage of bottom Thrust Arm. Adapts itself to a score of uses. Special formula gray iron casting. Wearing parts of malleable iron to insure against breakage due to sudden strain. Price, each, 35c.



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"Never Lets Go"

Self-Vulcanizing patch guaranteed to outlive the tire. For large or small blowouts. Stretches with the tube. It won't chafe or scuff, creep nor wrinkle. Has all the virtues but not the faults of ordinary patching material.

The

TRADE MARK REGISTERED EMCO

Made by the

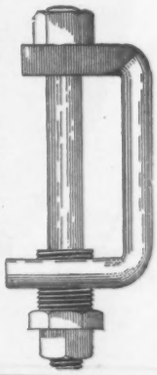
EMCO MFG. CO.

42 Court Street

Binghamton, N. Y.

Spring Support Clamp

For Chevrolets, Saxon and other cars equipped with quarter elliptic springs. Positive insurance against breakage of spring bolts. Consists of special steel bolt, forged steel bracket, tubular compensating nut, heavy duty lock washer and hexagon lock nut. Unconditionally guaranteed. Packed two in a box. Full directions. Price $2.25 each. $4.50 per pair.



For Immediate Delivery New Material in Large Quantities

WE SELL TO THE TRADE ONLY

150—Touring Bodies, high grade, 5-passenger, some painted and some in priming coat, not upholstered, complete less locks, each.....$22.50

2000—Timken Brake Drums, outside diameter about 12 in., diameter hub hole about 2 in., extreme width, 2⅞ in., 8 bolt holes equally spaced, diameter, 25/64 in., center to center of bolt holes about 5 in., each..... .90

40—Frames for trucks, each..... 25.00
Send for Blue Prints of any of the above items.

ELECTRICAL MATERIAL

1000—U. S. L. 6-volt, 90 amperes starting and lighting batteries, model AD-313-DF. Height 9 in., width 4¼ in., length 20⅜ in. These batteries were built for export and cost originally much more than the domestic. Jars are unbreakable. These batteries have been shipped dry. Cells contain no solution and are sealed to exclude air. Batteries ready for solution and service. For Overland Model 83 and other cars, each 22.00
Lots of 10, each..... 19.00

144—Sets Remy 6-volt starting, lighting and ignition systems, consisting of Model 231-B generator with Model 264-A Relay regulator, Model 284-B coil, Model 219-D, 6-cylinder distributor and Model 303-B starter with Bendix drive. Per set..... 65.00

900—Electric Auto Lite 6-volt lighting generators model GD-1001 with cutout. Originally used on Overland cars. Can be installed on practically any car. Each..... 25.00
Lots of 10, each..... 21.00

4200—Electric Auto Lite Starting Motors, MC-1070, with Bendix Drive. Fits Models 83 and 85 Overland cars. Can be installed on others. Each..... 25.00
Lots of 10, each..... 20.00

2000—Whitney Silent Chains, Nos. 1201, 35½ in. long, 94 links. Each..... 2.50
Lots of 25, each..... 2.00

STROMBERG CARBURETORS

1200—Stromberg Model M ¾-in. vertical intake, each.....$ 8.00
Lots of 25, each..... 7.00
Lots of 100 or more, each..... 5.75

ROLLER BEARINGS FOR DODGE CARS

20,000—No. 288 Roller Bearings which fit rear wheels of all Dodge Models 1915 to 1920. Bearing fits Timken cup No. 284, each..... $1.65
Lots of 100 each..... 1.45

CLUTCH THRUST BEARINGS FOR BUICK CARS

2700—Clutch Thrust Throwout Bearings for Buick cars, Model D-45, Light Six 1916 and Model D-55, Big Six 1917. Buick part number is 34,420. Each..... 1.75
Lots of 50, each..... 1.50

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10,000—No. 202-B Seubert Annular Single Row bearings, each.....$1.00 net
2800—No. 308 S. R. B. Annular Single Row bearings, each..... 3.75 "
7200—No. 1310 N. D. Annular Single Row bearings, each..... 5.38 "
6600—No. 1310 W. M. Annular Single Row bearings, each..... 5.38 "
140—No. 1408 N. D. Annular Single Row bearings, each..... 5.50 "
700—No. 307 W. M. Annular Double Row bearings, each..... 4.38 "
156—No. 0210 N. D. Radax bearings, each..... 3.50 "

TIMKEN CONES AND CUPS

300—No. 319 Timken cones, each..... 2.10 "
150—No. 337 " " " ..... 2.31 "
126—No. 385 " " " ..... 2.84 "
300—No. 395 " " " ..... 3.15 "
150—No. 440 " " " ..... 3.25 "
990—No. 444 " " " ..... 3.26 "
30—No. 4364 " " " ..... 3.78 "
50—No. 5550 " " " ..... 5.46 "
37—No. 5756 " " " ..... 6.09 "
93—No. 6350 " " " ..... 7.98 "
57—No. 6354 " " " ..... 7.98 "
303—No. 313 Timken cups, each..... .95 "
175—No. 383 " " " ..... 1.37 "
140—No. 412 " " " ..... 1.26 "
437—No. 3920 " " " ..... 1.68 "

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Automobile Parts and Equipment

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U. S. Ball Bearing Mfg. Co.

(Conrad Patent Licensee)
Palmer Street and Kolmar Avenue, Chicago, Illinois



STAR
HAND MADE
TIRES

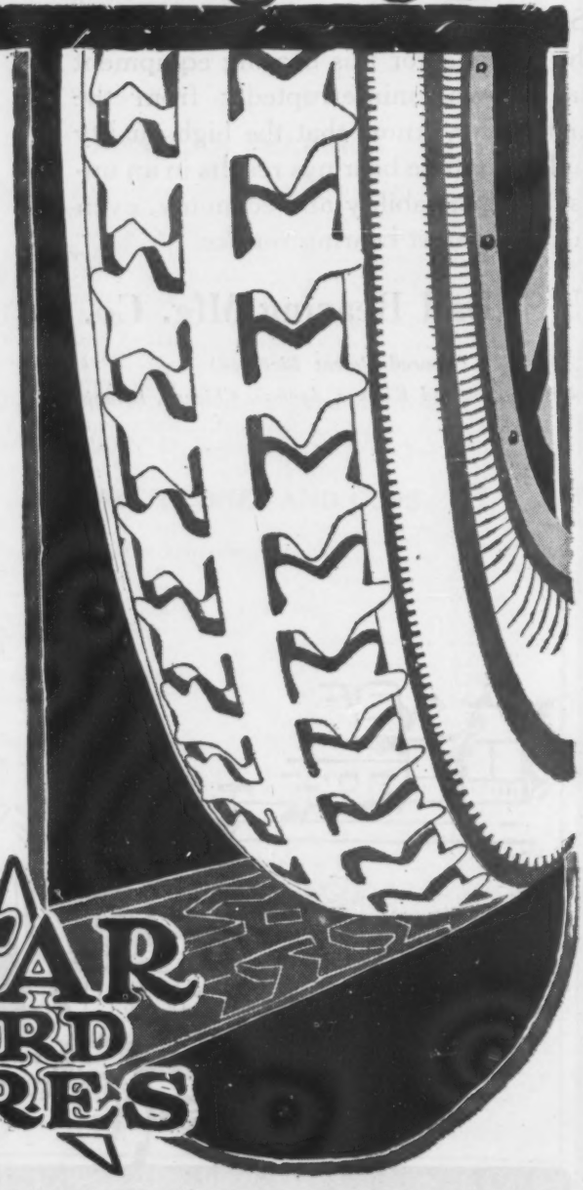
Your Customers Respect Your Judgment

They rely on it—to assure them of *better* service from the merchandise you *recommend.*

Switch customers to high grade tires and you can count on this; their enthusiasm over the mileage obtained through your advice, indirectly sells *more* tires for you.

Star dealers find the Star Tire a business builder. Increasing profits for *them* through greater profit—more mileage we mean—to their customers.

There's only one place in your territory where Star Tires can be purchased—*your store.* The Star franchise is *exclusive.* Write for details.



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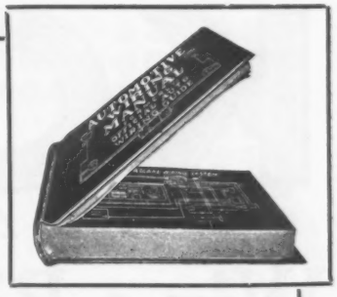
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will NEVER be in doubt over electrical problems, and can do much more effective and profitable work every day when using the

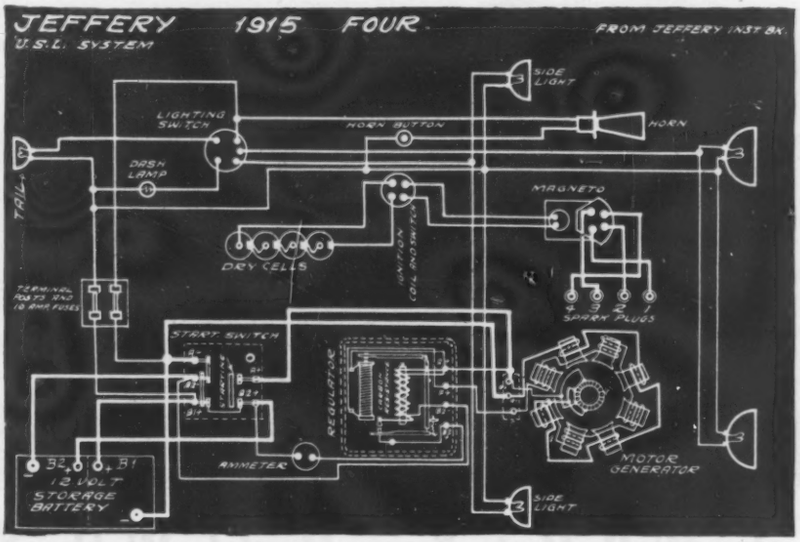
AUTOMOTIVE WIRING MANUAL

the *original* and only complete collection of BLUEPRINT wiring diagrams of all cars and trucks from 1912 to and including 1920 models; also Internal Wiring Connections of all Motors, Generators, Regulators, etc., of all Starting and Lighting Systems; Battery Voltage, Generator Models, etc., etc.

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There is nothing similar on the market *at any price* that will give you the authentic, down-to-date, vital information contained in the New Edition of the AUTOMOTIVE WIRING MANUAL. It contains no junk drawings to fill space; no unnecessary reading matter to take up your time when it is most valuable.

Each drawing is made especially for the Manual from manufacturers' original shop blueprints or other authorized data and not from photographic reproductions from catalogs, trade papers, etc., whereby the details would possibly be incorrect and so small as to be practically illegible.



(NOTE:—The above illustration is about one-third the regular size of 7½ in. x 10½ in.)

The AUTOMOTIVE WIRING MANUAL is now in its sixth edition. It has met with tremendous success everywhere. It is now being used in every part of the world where American Cars are sold. Leading Automobile Schools use it in class instruction. It is internationally recognized and accepted as the Official, Authentic, and Complete Collection of Blueprint Wiring Diagrams,—both circuit and internals. Do not be deceived into buying something that is advertised and offered as "just as good" for either a lower or higher price. Anything of genuine worth always has its imitators, but they never compare with the original. *Get only blueprints.* They are easier to read and do not soil readily through handling.

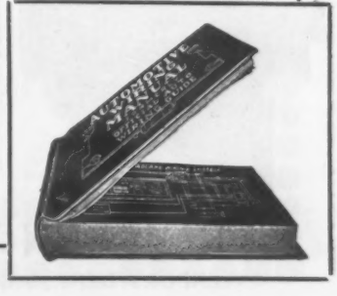
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KOL-BEN

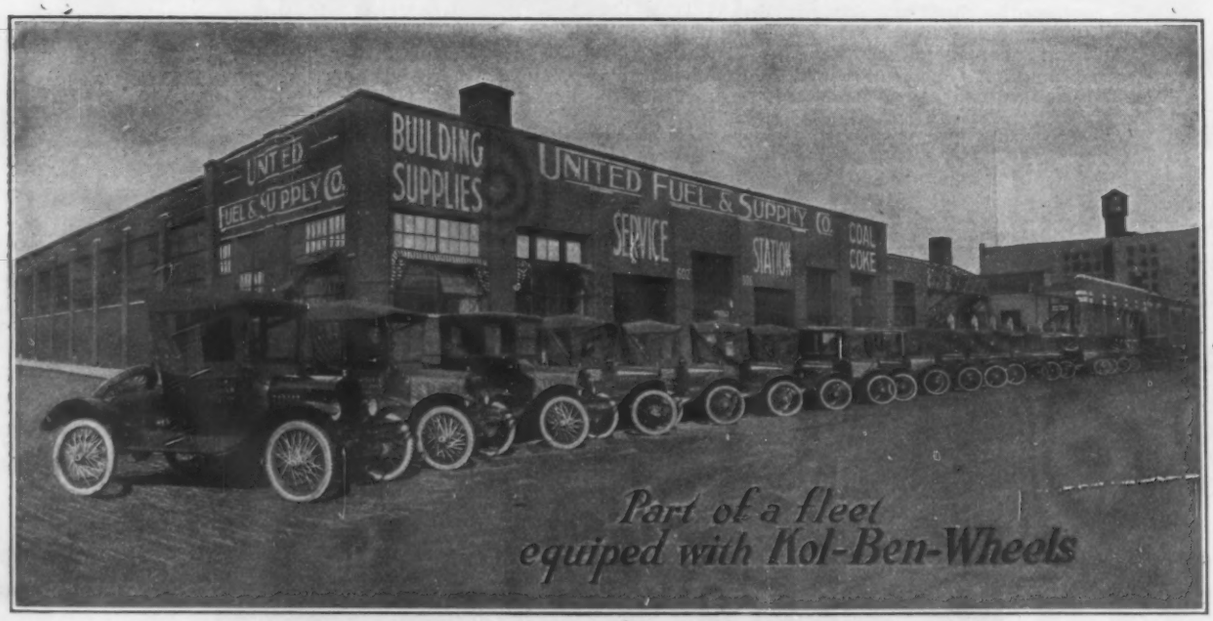
THE DOUBLE-LOCKED WIRE WHEEL

Win a Big Commercial Equipment

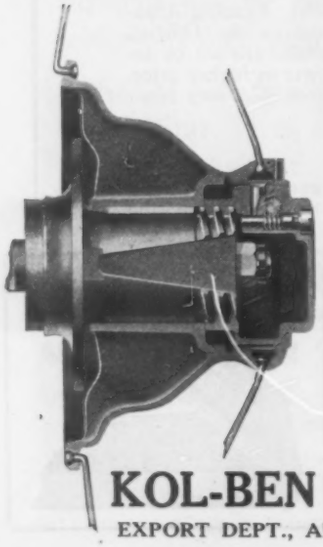
United Fuel Company, Detroit, Equips Its Whole Fleet with Our Wire Wheels After Exhaustive Test

The company wanted efficiency, upstanding wheel durability, and the distinctiveness of splendid wire wheel equipment. It cost more—a little—than competitive wire wheels—but the United Fuel Company knew only the best and most rugged wheels could stand the strain of continuous commercial service. Therefore

KOL-BEN WIRE WHEELS WON



These Wheels Will Put You Right With Your Trade



The Sectional view of the Kol-Ben indestructible hub which shows the double-locking feature. All lock parts are made of chrome nickel steel, heat treated and hardened. Its tremendeus built-in strength makes this hub capable of resisting even the most severe shocks and blows. It is a mechanical masterpiece.

The sales possibilities of Kol-Ben Wheels are unlimited—and the first sale is all that's necessary.

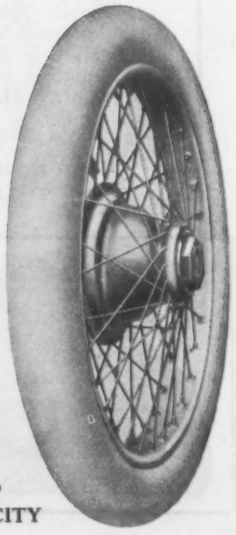
They Are Crack Repeaters

Everywhere a set is sold it operates immediately to create new sales. The Kol-Ben is the livest repeater in the wheel business.

Dealers who sell — who don't simply keep store—can make splendid quick profits with this line—and the repeat orders will make these profits continuous.

The proposition is as fine as the wheels—write for it now.

Notice the tremendous strength in Kol-Ben wheels; extra spokes which give greater resiliency and which make the wheel non-collapsible. Its ease in removing, caused by the integral construction is worthy of deep consideration by the buyers. This type of construction makes the wheel non-sticking.



KOL-BEN WHEEL CO., Inc. **Cadillac, Mich.**

EXPORT DEPT., AUTOMOTIVE PRODUCTS CORP., WOOLWORTH BLDG., NEW YORK CITY



Made for

MAXWELL

CARS

KINGSTON CARBURETORS

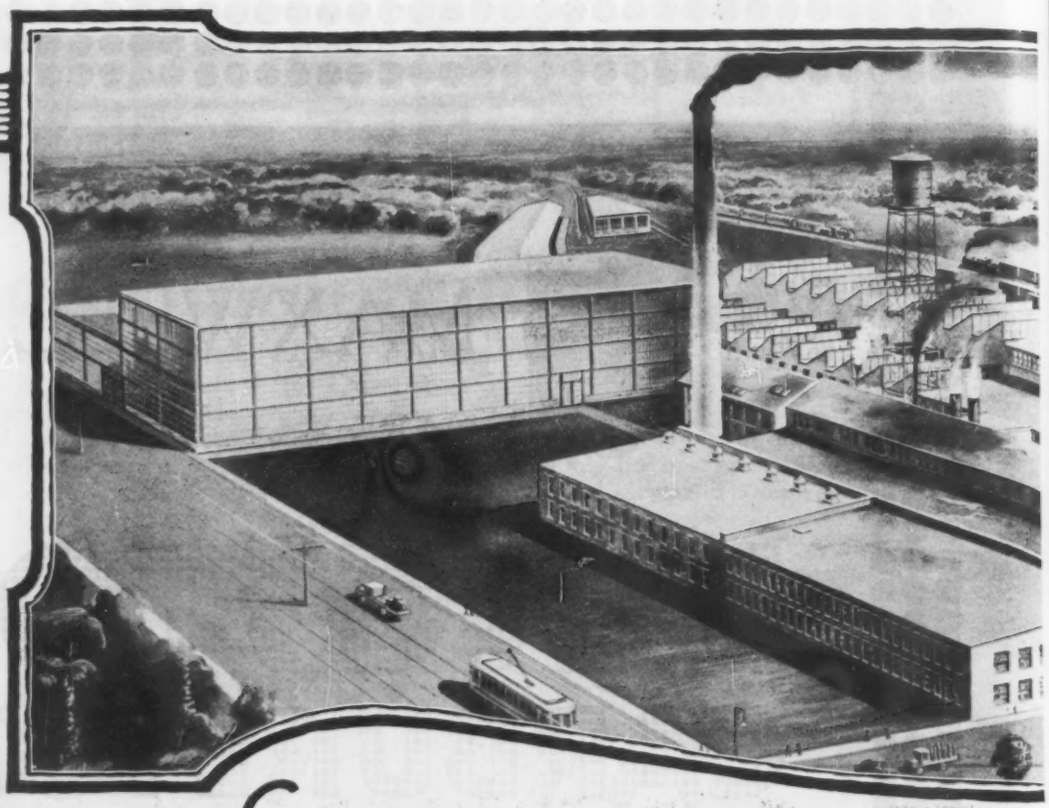
THE KINGSTON Company, oldest and largest builder of carburetors in America, has perfected a special carburetor for Maxwell cars. The Maxwell Special is simple, staunch, flexible and easily controlled. It will get the last atom of power from your gas. It will operate smoothly, easily, dependably. If you have never known the complete satisfaction in having a carburetor that meets every demand (all the time, in good conditions and in bad, investigate this special Maxwell Kingston. ¶ It has been built for the Maxwell owner. It will solve, once and for all, his carburetor problems. It is backed by the strongest guarantee that we know how to make.

TO MAXWELL OWNERS—The price of this super carburetor, with hot-air stove complete, is $11.00. If your dealer can't supply you send order to us direct. TO DEALERS—Write at once for special proposition.

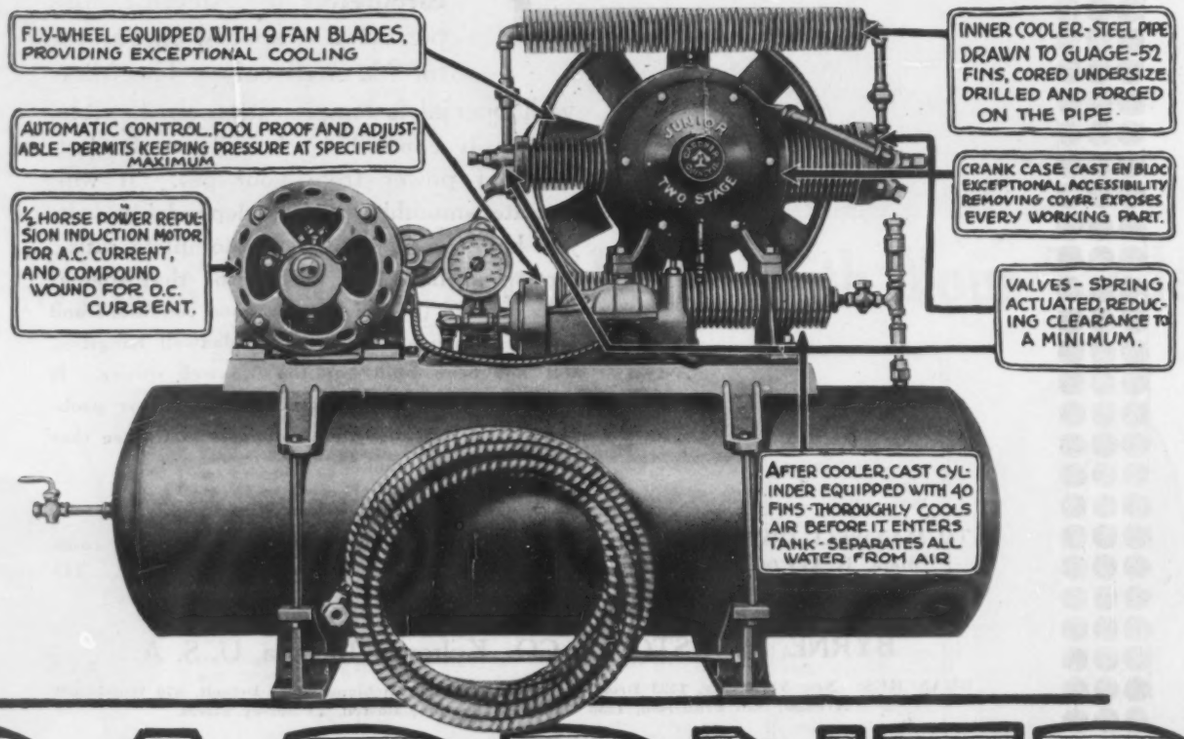
BYRNE, KINGSTON & CO., Kokomo, Indiana, U. S. A.

BRANCHES: New York City, 1733 Broadway; Chicago, 1430 Michigan Ave.; Detroit, 870 Woodward Avenue; San Francisco, 1235 Van Ness Avenue; Boston, 15 Jersey Street

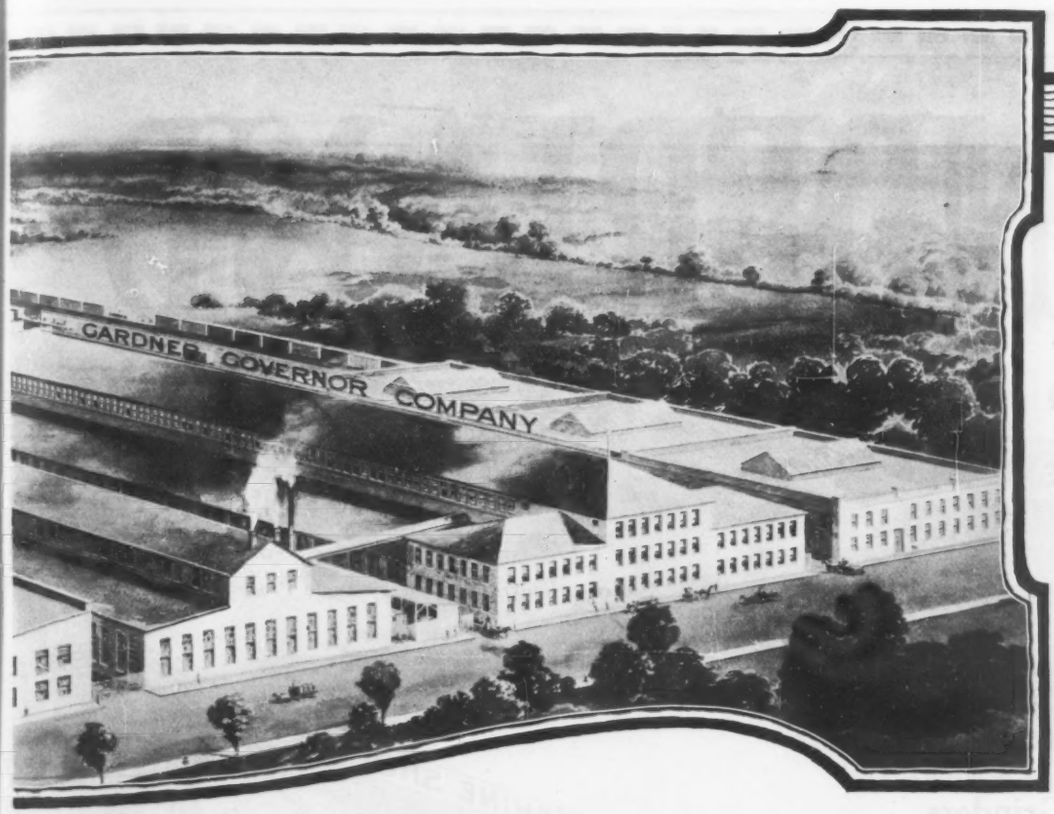
Chicago Show—Coliseum, January 24-31.



The Past Record of the Plant Forecasts the



GARDNER



Performance You May Expect *from the* Compressor

For over sixty years the Gardner plant has been successfully building high grade machinery. Today the plant covers over ten acres. The Gardner 2-stage Compressor is built here and represents—in design, in materials used, and in methods of manufacture—the best efforts that can be put forth by this powerful and long experienced organization.

Superior performance can be logically expected from a compressor with so much in the way of manufacturing facilities and experience behind it. You will find that the Gardner 2-stage Compressor gives it.

Figuring compressor cost on a cost per cubic foot of air per year basis (which is the correct method) the Gardner Unit is, we believe, the most economical source of supply of clean cool air that can be secured.

It is highly efficient, has a very long trouble-free working life and is always ready to maintain your high standard of air service. We would like you to inspect the line of Gardner Compressors on exhibition at our booth, International Amphitheatre Stock Yards during Show Week and verify by your own close technical examination the Gardner features of design and construction, in which high mechanical efficiency, accessibility and long working life have been developed side by side.

If this is not possible, let us send you full information on the Gardner together with the Gardner Proposal—a selling arrangement so broad and liberal that it makes it easy to own a Gardner.



Air costs the least where quality equipment rather than price equipment is selected

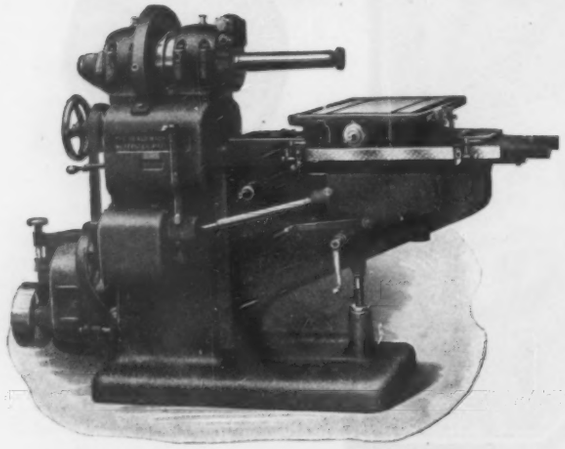
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C. A. DICKERSON, *Distributor* **Fisher Building**
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Manufactured by Gardner Governor Company

2 Stage AIR COMPRESSORS

SUNDERLAND



Heald Cylinder Grinders

Manufactured by

HEALD MACHINE COMPANY

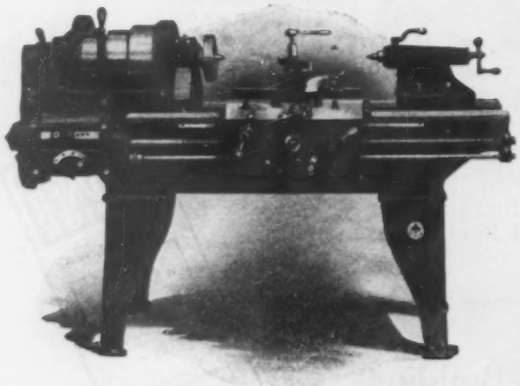
Worcester, Mass.



Scored cylinders repaired by Eagle Process



Note—Machine Tools Illustrated Used In This Plant



LeBlond Lathes & Millers

Manufactured by

LE BLOND MACHINE TOOL COMPANY

CINCINNATI, OHIO

SUNDERLAND

21st and Pacific Sts.

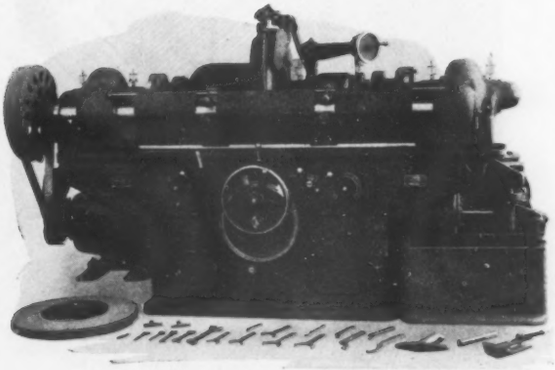
Specialists in Repairing Steam and

Cylinder and Crank Shaft Grinding, New

Scored Cylinders Repaired

AUTOMOTIVE MOTOR SERVICE





Landis Crank & Plain Grinders

Manufactured by

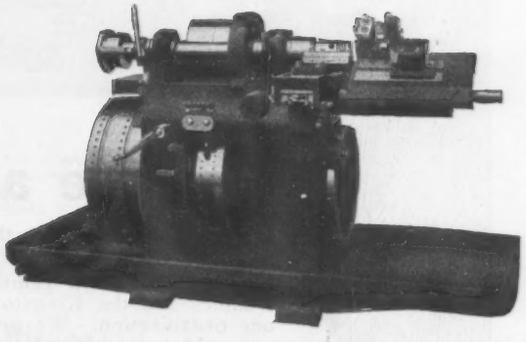
LANDIS TOOL COMPANY
WAYNESBORO, PENN.

MACHINE SHOPS
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Auto Truck & Tractor Motors
Gasoline Engines

Pistons, Rings, New Gears, Shafts, Axles, Etc.

by the Eagle Process



Gridley Automatic Piston and Ring Machines

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KINGSTON
IGNITION SERVICE



Positive and Reliable Ignition

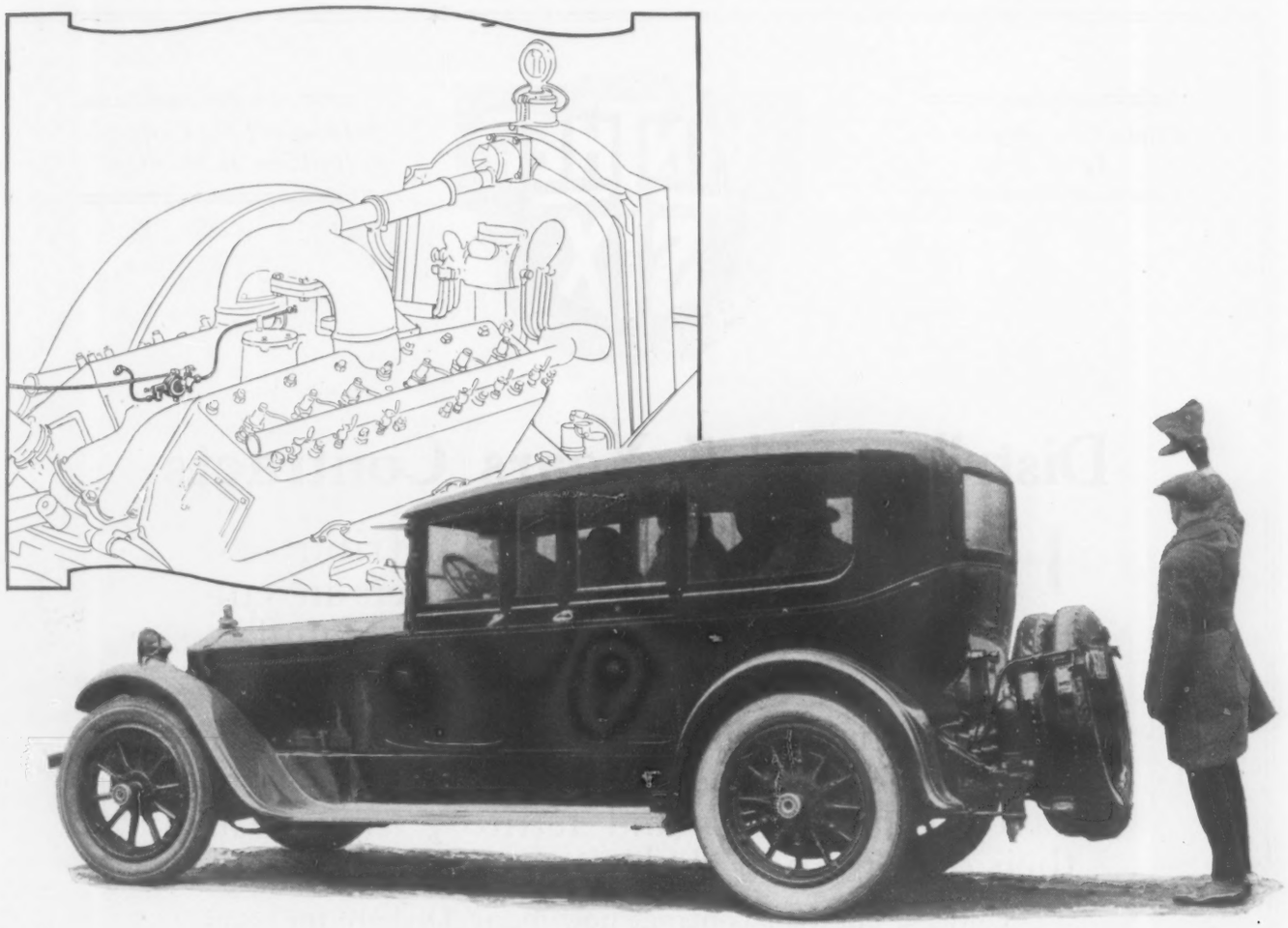
When ignition fails you there are any number of reasons and places in which to look for the source of trouble.

Users of Kingston Ignition Specialties have less of the common ignition troubles and the Kingston Line is the most complete manufactured by any one organization. We produce High Tension Magnetos, Low Tension Magnetos, Make and Break Coils, Dash Coils, Box Coils, Switches, Spark Plugs—there is nothing required in ignition specialties that isn't manufactured under the Kingston name. Write for our catalog.

KOKOMO ELECTRIC COMPANY

Kokomo, Indiana

Branches: New York City, 1733 Broadway; Chicago, 1430 Michigan Ave.; Detroit, 870 Woodward Ave.; San Francisco, 1235 Van Ness Ave.; Boston, 15 Jersey St.



LIVE STEAM INCREASES SPEED, POWER AND MILEAGE OF PACKARD TWIN SIX

Everyone knows the smoothness of a Packard is hard to improve, but by adding an Automatic Steam Carburetor the power, speed, and mileage was actually increased as shown in these tests.

One of America's leading newspapers wished to verify the claims we made for the gas saving ability of the Automatic Steam Carburetor.

They secuerd three cars—a Packard Twin Six, a Ford and a Paige. The three cars were run over a prescribed course and an accurate record made of fuel consumed.

An Automatic Steam Carburetor was then attached to each car. They went over the same course. The following table shows the results.

	Packard	Ford	Paige
Increase in mileage	41.3%	34.3%	30.8%
Power increase on 6% grade	9.0%	13.4%	11.2%
Increase in speed under pull, same gas	5.2 miles	7.0 miles	5.0 miles

Remember, these figures were compiled by disinterested parties. They are accurate. We do not ask you to take our word for the efficiency of the Automatic Steam Carburetor. It is based on actual tests like this and we make our binding guarantee of 25% to 40% saving of fuel.

The Automatic Steam Carburetor injects live steam into the gas mixture. It increases combustion, keeps spark plugs clean and eliminates carbon in cylinders. Can be easily and quickly installed in any car. This is an auxiliary carburetor attached to the gasoline carburetor on the car. Operated by dash control.

Do you want to handle this device in your locality? One or two installations will sell hundreds of others. That's the universal experience of our dealers everywhere. Do you want to add this new source of income to your business? Then write us. Ask for agency proposition. Get the details. You'll find discounts highly satisfactory. Write today.

AUTOMATIC STEAM CARBURETOR COMPANY
2490 Milwaukee Ave. Chicago, Ill.

Automatic Steam Carburetor

Production begins in April 1920

WINTHER SIX
KENOSHA WISCONSIN

Designed for Critics—Built by Mechanics

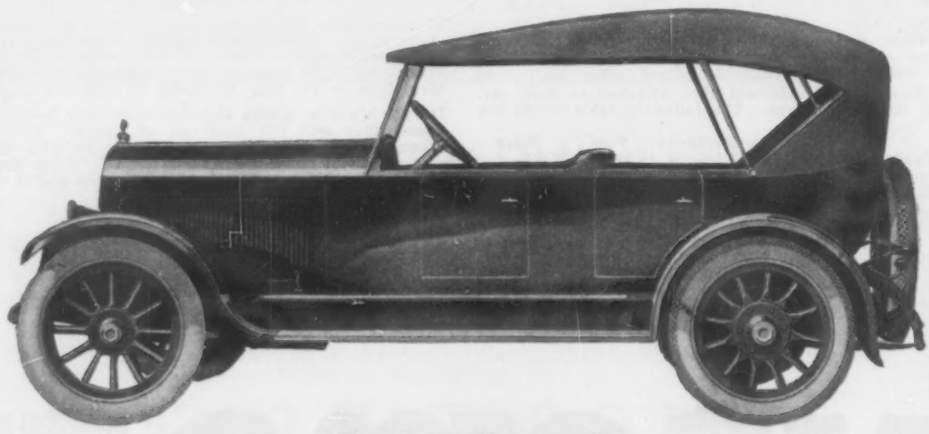
Distributors' 5 Years Contracts

HOW many Automobile Distributors, Dealers and would-be purchasers are embarrassed each year by Automobile Manufacturers cancelling contracts?

How many Distributors and Dealers have built up a good trade the first year or two, to have their discount and territory as well as their organization slashed to pieces?

Under a one-year contract how many Distributors and Dealers know "where they are at" and how many consider that they have a foundation for establishing their trade?

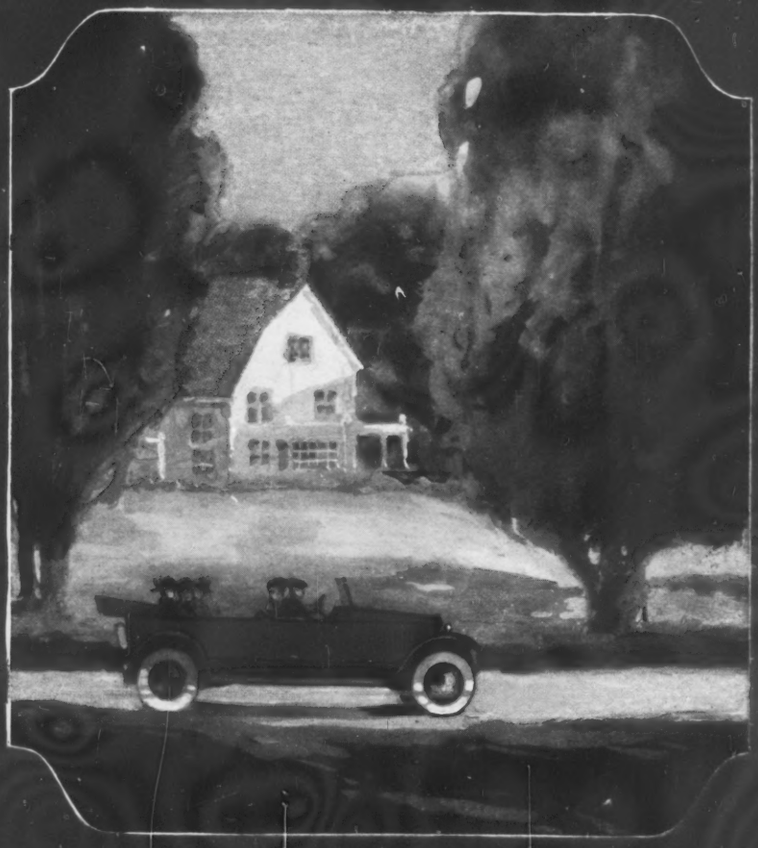
We are seeking satisfactory representation through Zone Distributors. Your territory may still be open. Wire or write us.



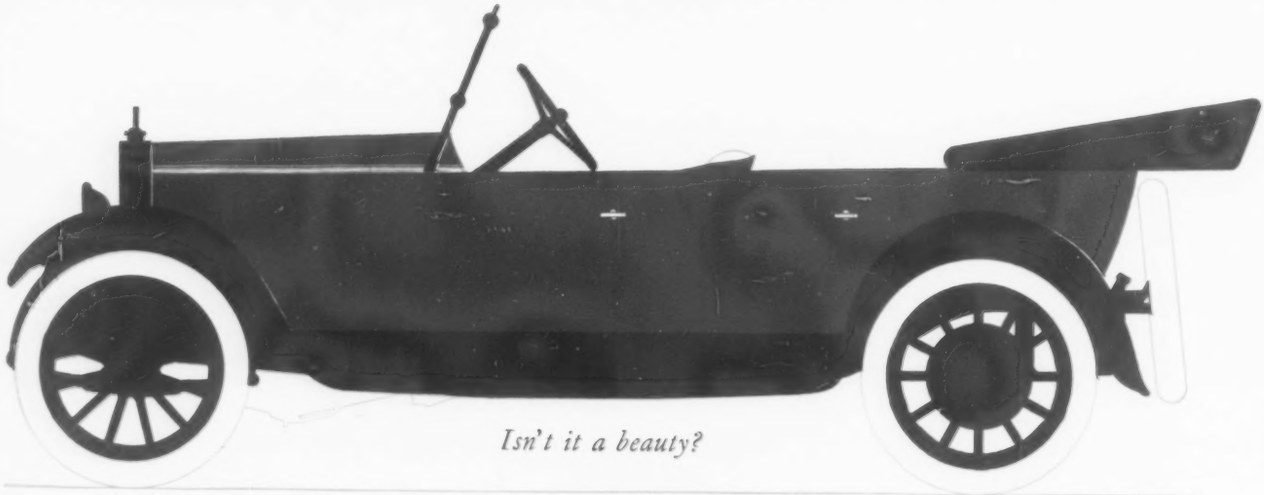
"Economy Essential"

WINTHER MOTOR SALES CORPORATION

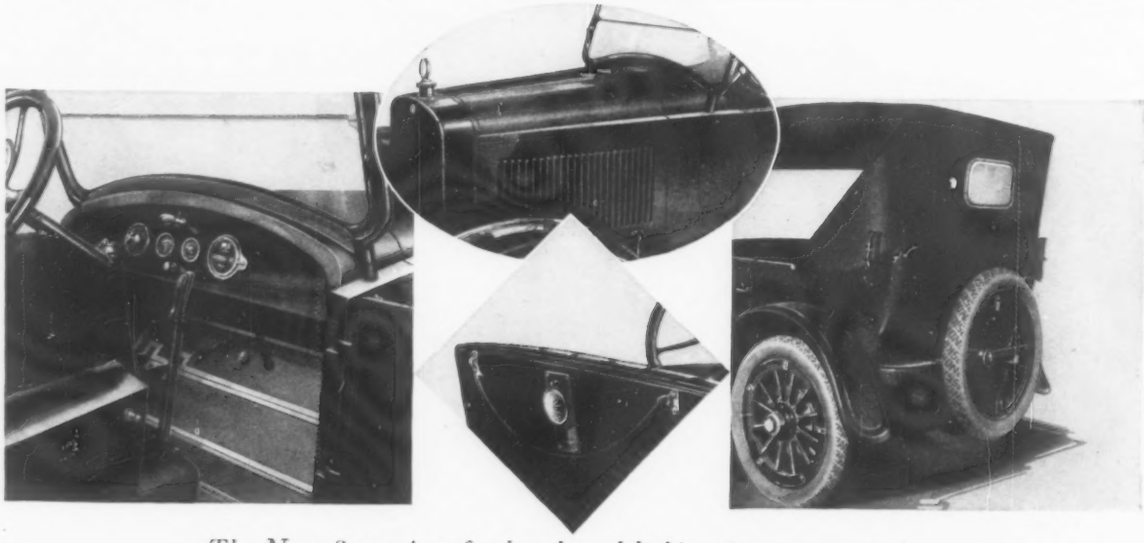
KENOSHA, WISCONSIN



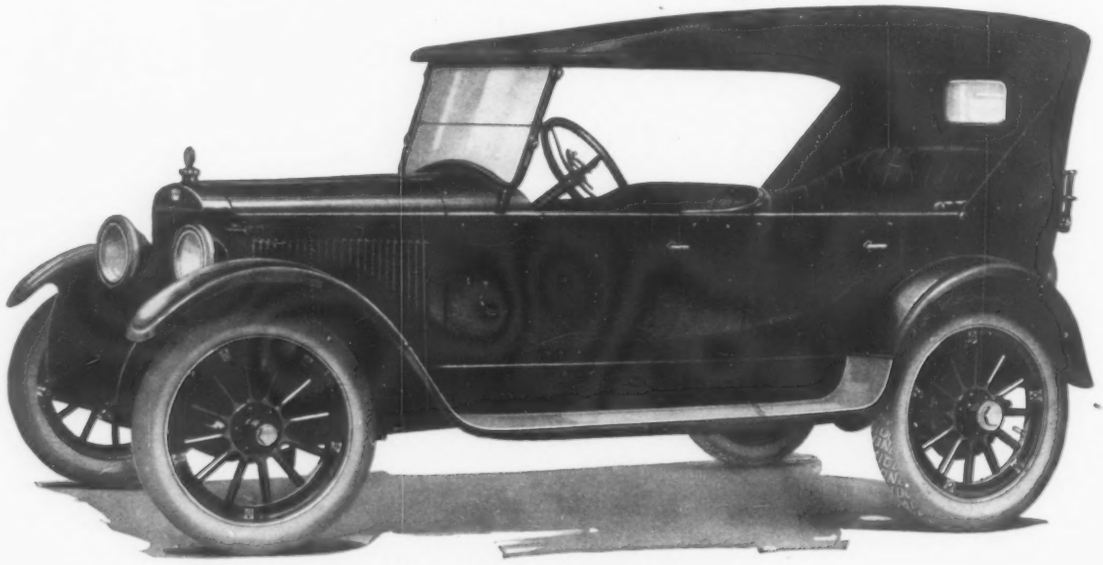
SAXON



Isn't it a beauty?



The New Saxon is refined and good looking from every angle



Here it is with the top up



THE NEW SAXON is a wonderful, beautiful motor car creation—ten years ahead of the times.

Men long of high standing in the Automotive World are responsible for it.

They have endowed it with features and developments that can be regarded as nothing short of master strokes in modern engineering.

Motor troubles that have puzzled all engineers for years are absent from this car—the new Saxon.

Carbon, valve-grinding, fouled spark plugs, waste of fuel, sluggishness, vibration, slow-starting, poor lubrication—all these grievous troubles have been eliminated.

Flexible and alert from its first hour, sturdy, graceful and smart in appearance, the new Saxon stands forth—a motor masterpiece.

Saxon Motor Car Corporation
Detroit



GIANT PNEUMATIC TRUCK TIRES

BRUNNER

The Giant pneumatic Truck Tire, admitedly a practical success, cannot gain the wide usage expected of it unless ample inflating facilities are found at frequent intervals in the cities and towns and along the main highways.

Brunner engineers have for two years worked with the development departments of the large tire makers and Brunner equipment was designed and built for this special service.

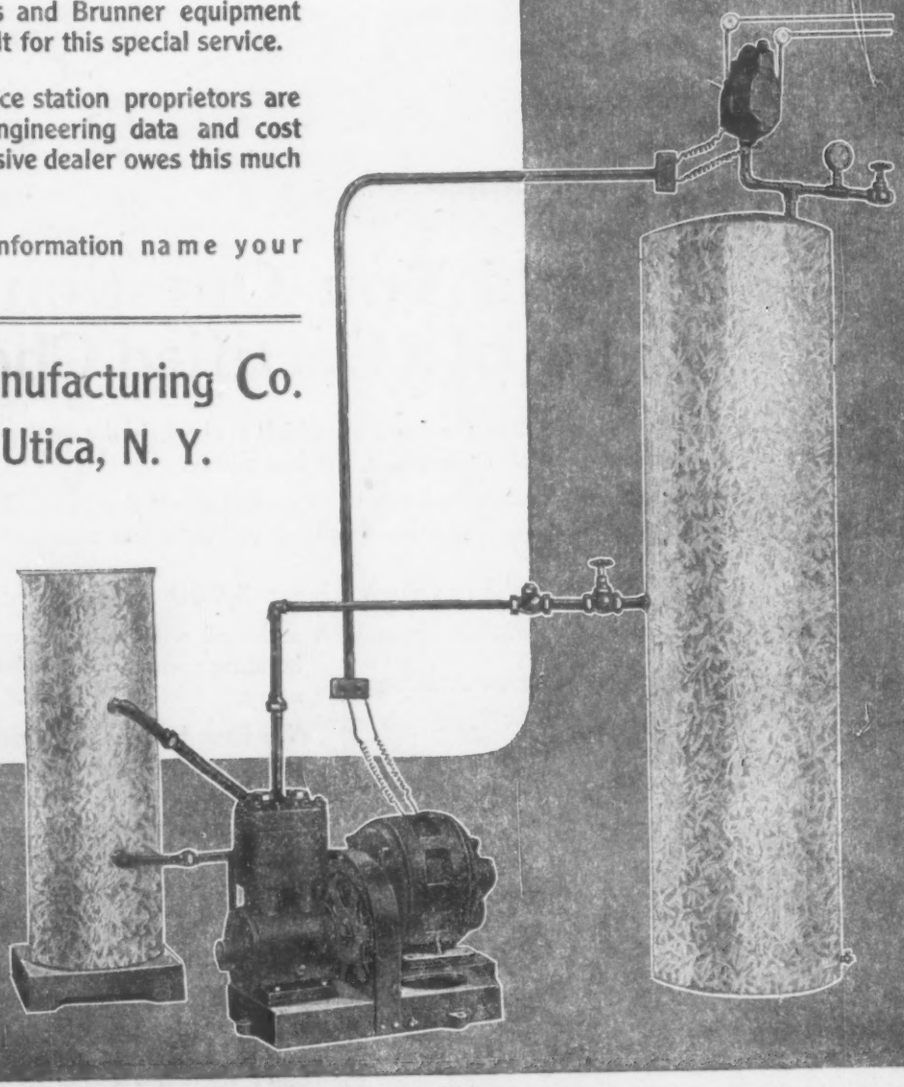
Dealers and service station proprietors are invited to request engineering data and cost figures. The progressive dealer owes this much to his trade.

In writing for information name your jobber.

Brunner Manufacturing Co.

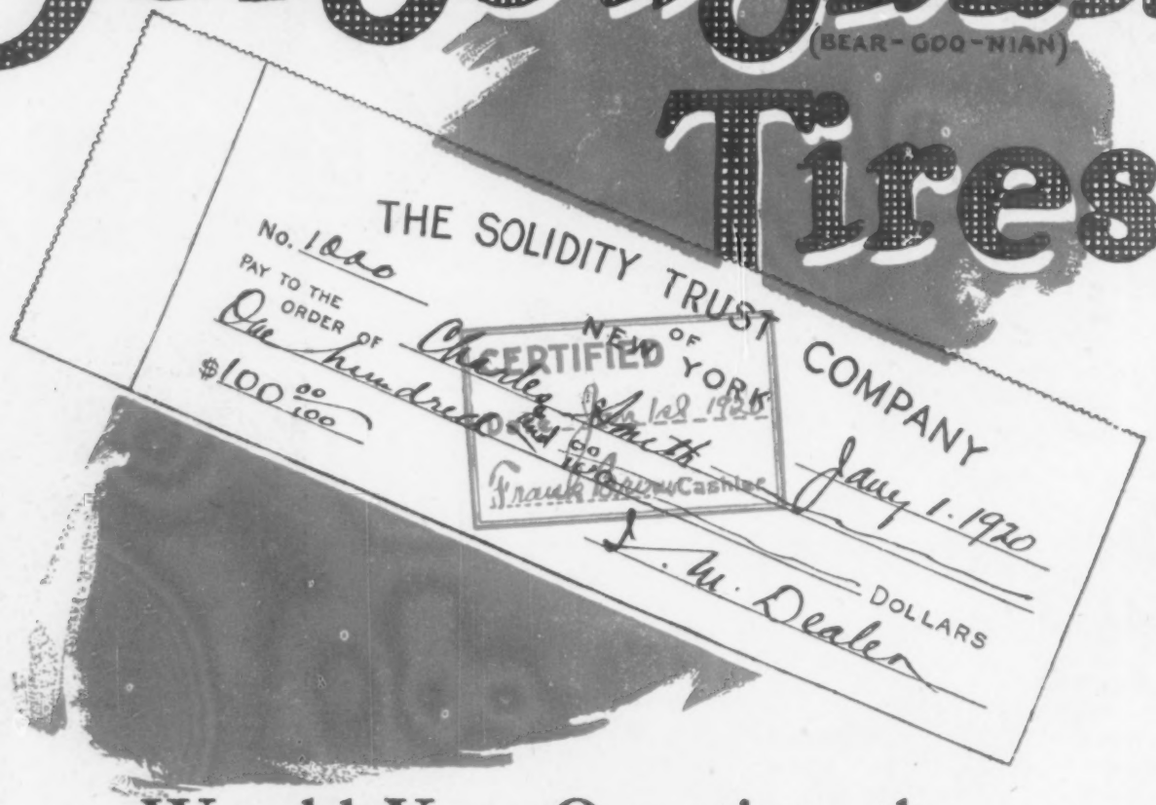
Works: Utica, N. Y.

Sales Offices:
UTICA, N. Y.
CINCINNATI, O.
KANSAS CITY, MO.



Bergougnan Tires

(BEAR-GOO-NIAN)



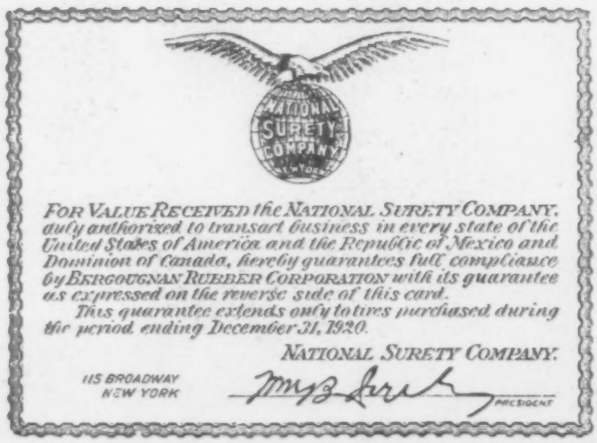
Would You Question the Value of a Certified Check?

You feel absolutely certain when the bank on which a check is drawn has certified it that you will receive the full value of the check down to the last penny.

That is just how we want dealers and tire users to feel about the BERGOUGNAN certified mileage guaranty. We want them to feel positive that they will get every mile that goes with the BERGOUGNAN guaranty:

—6,000 miles for fabric tires; 8,000 miles for cord tires.

In order to create this feeling of security we have arranged with the National Surety Co., the largest bonding company in the world, to certify our guarantee.



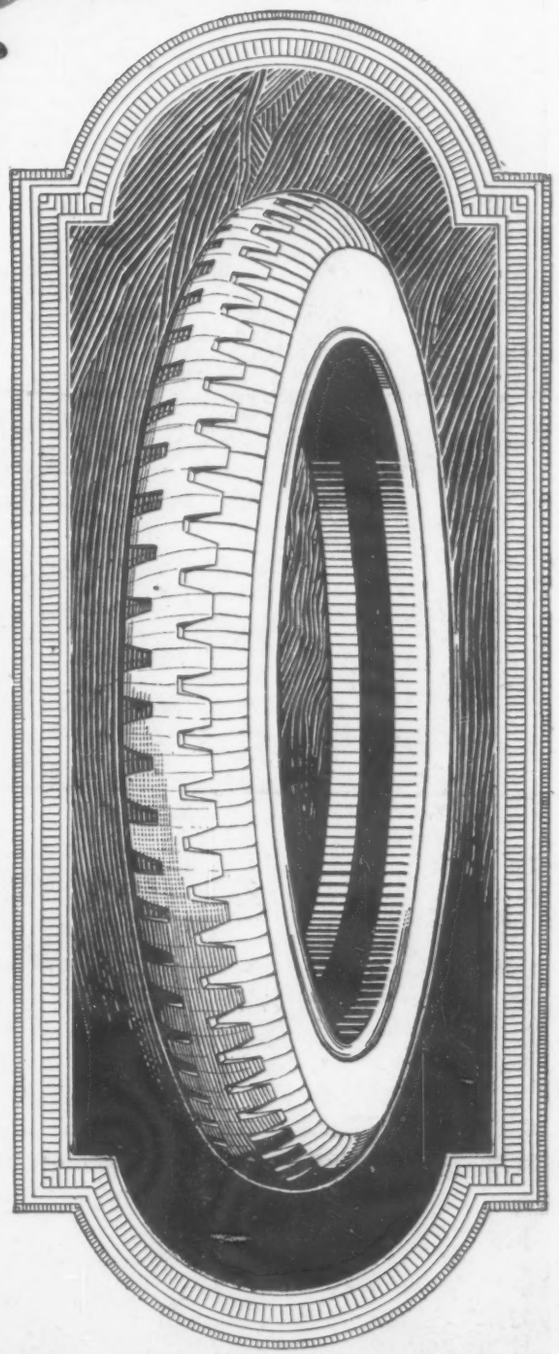
We have been making tires for more than twenty years and our reputation alone is enough to insure compliance with any promise we make, but we wish to leave no room for argument and to destroy all doubt as to the completeness of our adjustments in the event of any of our tires giving short measure.

And so, our guarantee is certified.

You will find the certificate herewith attached to every BERGOUGNAN tire you buy, or sell. It means that if we do not make good on our promise to give you the stipulated mileage, the National Surety Co. will.

Bergougnan Tires

(BEAR-GOO-NIAN)



Why You Should Sell Them

You should sell them because they are good tires, of course. If they weren't good tires—as good as the very best—we could not afford to furnish bond for their performance. You should sell them because they contain not only the best materials obtainable, the purest rubber and the staunchest fabric and cord made, and the science and skill that only the years can give, but BECAUSE AS SOON AS THE TIRE BUYING PUBLIC LEARN OF THE **CERTIFIED** MILEAGE THAT GOES WITH EACH TIRE THEY WILL BE THE EASIEST TIRES TO SELL ON THE MARKET.

No other tire manufacturer gives his dealers such a sure-fire sales-help as this.

Write to the firms listed below and get them to tell you what this feature of our selling policy is doing for them.

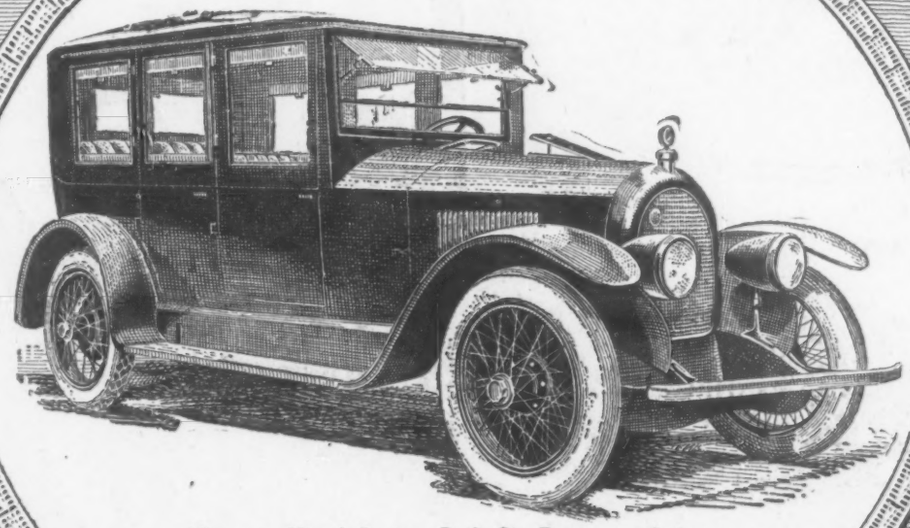
C. J. Van Houten & Zoon, Illinois Distributors, 140 So. Dearborn St., Chicago.
Haldeman Tire Co., California Distributors, 801 So. Los Angeles St., Los Angeles.
Haldeman Tire Co., California Distributors, 700 Van Ness Ave., San Francisco.
K. B. Auto Supply Co., New Jersey Distributors, 117 East Hanover St., Trenton.
Hardwicks-Etter Co., Texas Distributors, Sherman, Texas
Hamilton Motor Co., Western Pa. Distributors, Ben Avon, Pa
Seaboard Tire & Rubber Co., Maryland Distributors, 133 West Mt. Royal Ave., Baltimore.

Bergougnan Rubber Corp.
TRENTON, N. J.

BRANCHES:
New York, 49 West 64th St. Philadelphia, 1404 West Girard Ave.
Montreal, 325 St. James St. Toronto, 496 Yonge St.

FACTORIES:
Clermont-Ferrand, France Moscow, Russia
Trenton, N. J. Turin, Italy


"DEFIES TIME AND THE ELEMENTS"
CHASE
DREDNAUT
Motor
Topping
affords protection at all times — a long-lasting, rich appearing top fabric, backed by our reputation gained through 71 years' manufacturing experience. Drednaut is costly, but not an extravagance, owing to its sterling quality of durability.
Write for samples
L. C. Chase & Co.,
Boston
New York Chicago Detroit
San Francisco



The new Kissel Custom-Built Six Passenger Sedan

IN WORKMANSHIP, quality of material, design, finish and appointments, this new Kissel Custom-Built Sedan emphasizes Kissel exclusiveness.

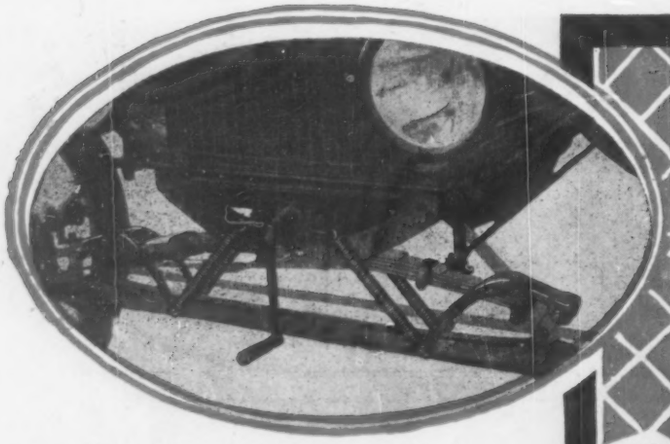
With all the deftness of the true artisan, there is an exquisite combination of design and coloring—a blend of custom-made refinements and comforts—unexpected charms that reveal an exclusive originality.

The Custom-Built 6-Passenger Sedan and 4-Passenger Coupe on display at your nearest Kissel Dealer's salesroom. Send for "The Aristocrats of Motordom" free on request.

Dealers: Attractive opportunity in open territory for right parties. Kissel Franchise details on request.

KISSEL MOTOR CAR CO., Hartford, Wis., U. S. A.

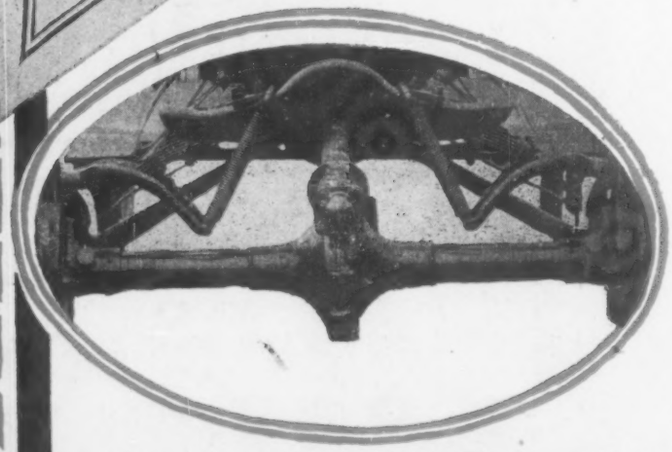
KISSEL Custom-Built Six



H. & D. Shock Absorber Installed on a Ford Passenger Car



U. S. Patents—May 8, 1918;
April 23, 1918;
Letters Patent in Canada



H. & D. Shock Absorber Installed on a Ford Commercial Car

H&D

SHOCK ABSORBERS "Single *or* Twin Arm"

offer

Jobbers the Most Complete Service Ever Known

H. & D. Shock Absorbers have a reputation with jobbers. They always have offered the most comprehensive service in the replacement of parts. In fact it is already known by jobbers that it is as easy to secure replacement parts of H. & D. Shock Absorbers as it is standard equipment parts for Fords themselves.

And now—to round out the service complete—we are in a position to furnish jobbers with complete full page electrotypes for their catalogs. You can make up your forms in advance, wire, write or telephone us, give us the size of the page you have assigned to H. & D.—and an electrotype the right size will come to you quick.

and

Dealers a Guarantee That Stands Alone

Besides, H. & D. Shock Absorber service extends farther than the jobber. Its guarantee to dealers stands alone. If after 30 days your customer is dissatisfied with H. & D. Shock Absorbers, he may return them and have his money refunded. We will send you a new set and our check for $3 to pay you for your trouble.

That is our idea of a guarantee worth while—and H. & D. dealers agree with us.

Backed Up by Owner Demand for Years

H. & D. Shock Absorbers are not new. They are well established and on the cars of thousands of Ford owners. There is a constant — and growing — demand for them and they move through your stock in a hurry.

H. & D. Shock Absorbers in your stock mean a bigger and more profitable winter business. Place your order with your favorite jobber.

H. & D. COMPANY

Goodland, Indiana

IN CANADA

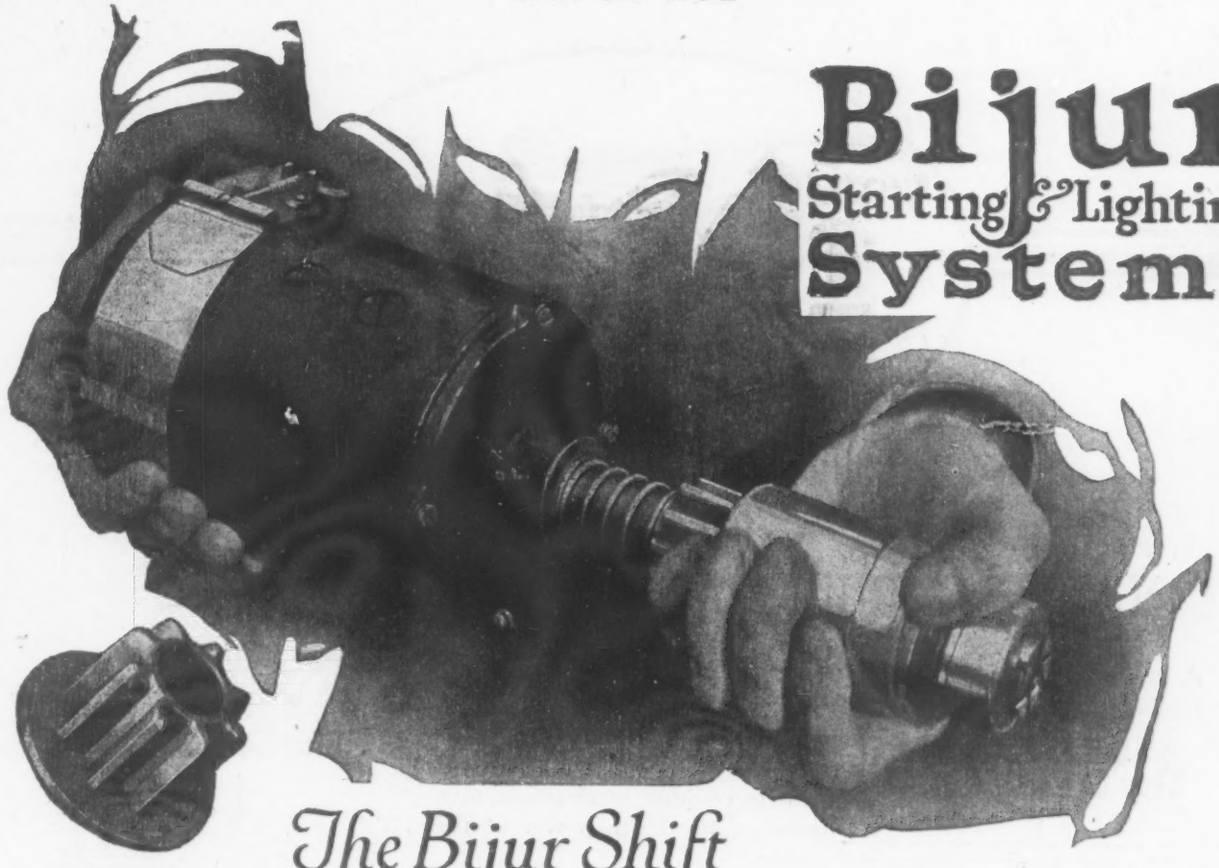
RICHARDS-WILCOX CANADIAN CO., LTD., LONDON, ONT.



LAFAYETTE

Naturally we are gratified that the public, in discussing the new LAFAYETTE, should, in so matter-of-fact a manner, assign it to the front rank of the world's finest motor cars

LAFAYETTE MOTORS COMPANY
at *Mars Hill*, INDIANAPOLIS



Bijur Starting & Lighting Systems

The Bijur Shift

8-Tooth Pinion

Why the Bijur Shift Excels

Automatic Engagement
Positive Engagement
Small Motor Pinion
Backfires Harmless
No Pinion Jamming
No Driving Spring
Fully Enclosed
Not Disabled by Oiling
Shockless
Noiseless
Light Weight
Current Economy
Cold Weather Ability
Harmless to Press Starting Switch with Engine Running
No Intermittent Ticking of Pinions Against Flywheel
Found only on Bijur Starting Systems

Small and Light in Weight

By doing away with the threading of the pinion and the threaded sleeve on the shaft, the pinion mounted directly on the shaft can be smaller by two or three teeth than was formerly possible. Consequently pinions of 8, 9, and 10 teeth replace those of 11 to 13 teeth and the ratio between flywheel ring gear and motor pinion is greatly increased. Thus the leverage of the motor to start the engine is much greater while the faster running motor becomes more efficient and smaller.

Due to the above and to the complete elimination of much unnecessary weight thru painstaking design, the Bijur Start Motor weighs in some cases almost half, and yet shows greatly increased cranking qualities.

Due also to the above facts, the ampere-hour output of the storage battery in starting an engine that is Bijur equipped, is always less than with other systems.

At the same time the efficient motor, the great leverage and the fine design are all directed to cranking at really adequate speed with the least current, in cold weather, when the engine is stiff and the battery is low. This is the condition for which the outfit is designed and the higher cranking speed of the engine in warmer weather is merely incidental to accomplishing the end sought.

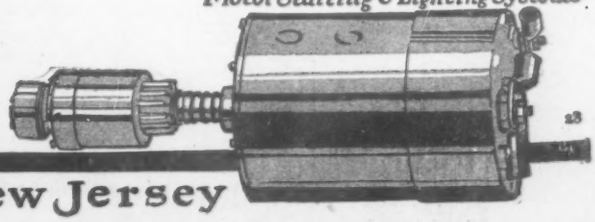
The Bijur Shift has earned a reputation in the entire automotive field for its ability to eliminate jamming of the pinion, breaking of flywheels and damage due to backfire.

The Bijur Starting and Lighting System is standard equipment on many of the leading American and foreign cars and has met with equal success on motor trucks, motor boats, airplanes, dirigibles and tanks.

Bijur Motor Appliance Company

Hoboken New Jersey

Motor Starting & Lighting Systems



Flexedge
SELF-SEATING
LAMINATED VALVES
Sensible-Logical-Inevitable
A Valve Seat Carbon Remover at Work While You Drive

SHOW YOUR CUSTOMERS EXACTLY HOW VALVE CARBONIZATION AFFECTS MOTORS

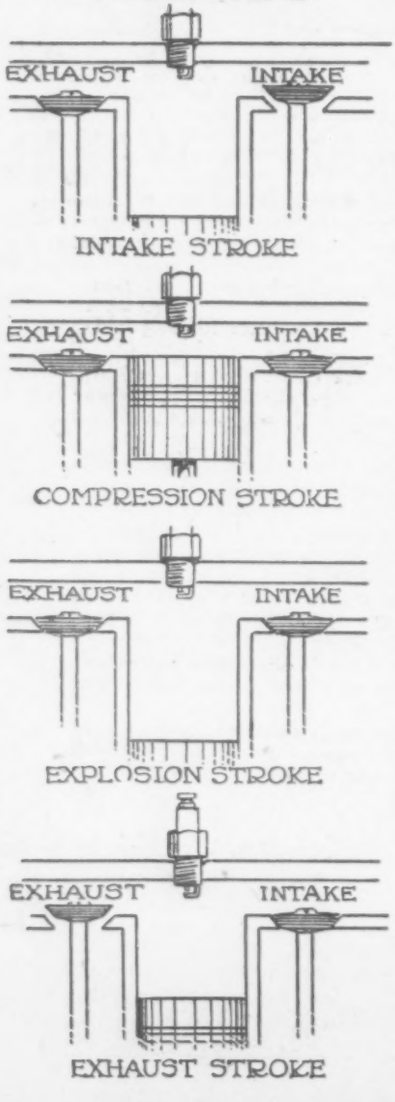
As the piston goes downward, a partial vacuum is created. A leaking exhaust valve, during the intake stroke, draws back from the exhaust manifold burned gases, which dilutes the fresh gas from the carburetor. Burned gases not only have no power value, but tend to smother combustion, thus lowering the horse power of the motor.

If the valves are imperfectly seated, unburned gas will be pumped into the exhaust manifold, compression will be lowered and the horse power thereby decreased.

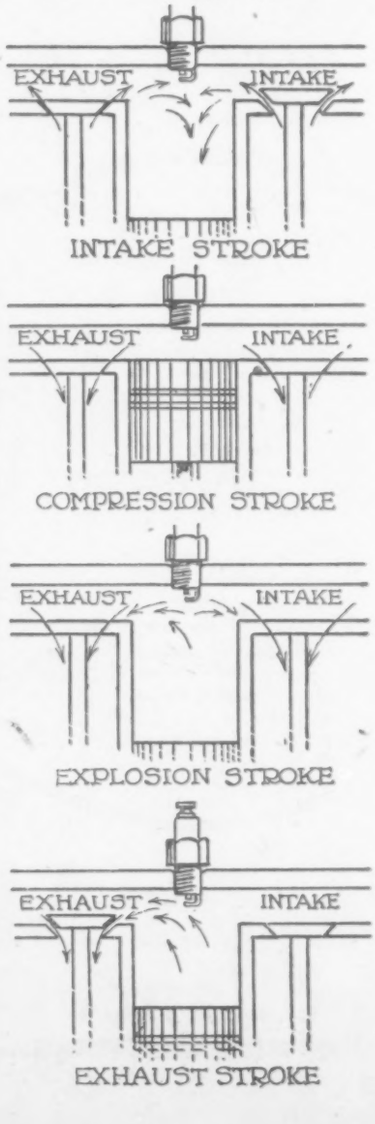
During the first half of the explosion stroke the interior of the cylinder contains a burning gas with temperatures running from 3000 deg. to 4000 deg. Fah. and with pressures running from 400 to 700 lbs. per sq. in. If the exhaust valve is imperfectly seated a flame with the intensity of the hottest blow pipe is shot through the tiny opening with a destructive effect and warpage of the valve results. In addition to the destruction of the valves the leakage of pressure causes a lowering of horse power.

In general, carbon deposits are caused by excessive lubricating oil in cylinders, and valve stem guides. Some of this excess oil is of necessity carried to the valve seat. During the exhaust stroke tiny particles of carbon from the burned gas are deposited on the wet seat. Soon the valve is leaking, permitting the escape of flame. Immediately the oil on the seat is burned and more carbon is thus formed. Flexedge valves with their gentle scraping action continually remove these carbon deposits.

FLEXEDGE
The Clean Valve



The Dirty Valve



Flexedge
SELF-SEATING
LAMINATED VALVES
Sensible-Logical-Inevitable
A Valve Seat Carbon Remover at Work While You Drive

FLEXEDGE VALVES ARE SELF SEATING AND SELF GRINDING—THEY PREVENT THE ACCUMULATION OF CARBON

It's in their design and construction—a perfected and developed use of the laminating and damascening processes known for many years. FLEXEDGE Valves are built up of paper-thin, highly tempered steel discs clamped together under tremendous pressure. They are rigid, except on seating face—elastic only at edges—rapid heat radiators snapping silently but tightly into their seats.

TESTED AND PROVED BY OVER 5,000 DEALERS

Flexing along their elastic edges, like the leaves of a spring, they grind away the carbon as fast as deposited. And they last as long as the motor they are used in, keeping the valve seats clean and bright all the while.

Installed just like other valves, but they soon pay for themselves by ending valve grinding. Order your sample set now and put FLEXEDGE on trial.

The FLEXEDGE principle is shown below with the motion greatly exaggerated in the cuts. In figure (1) you see the valve as it rests in seat during the compression stroke with the discs perfectly flat.
In figure (2) the valve is shown with the edges of the discs curved slightly upwards as the pressure of the explosion causes a minute deflection.
In figure (3) the discs are shown curved slightly downward as happens when the cam strikes its powerful blow. The entire movement is so small as to measure only a tiny fraction of a thousandth part of an inch.

SELF SEATING VALVE CO. CHICAGO

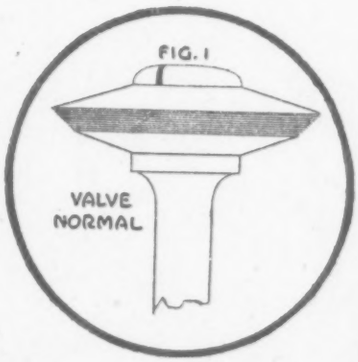


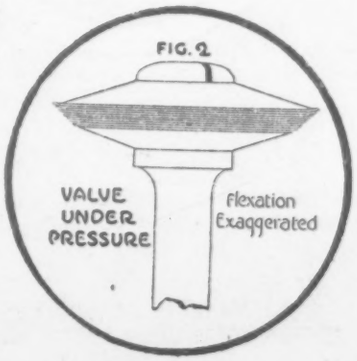
FLEXEDGE JOBBERS

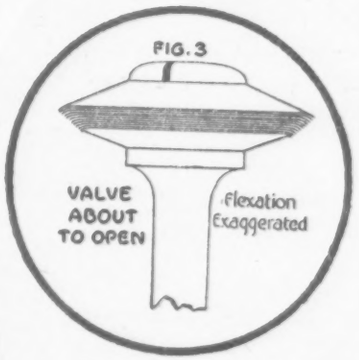
HERRING MOTOR COMPANY, Des Moines, Ia.
THE GIBSON COMPANY, Indianapolis, Ind.
MOTOR & MACHINISTS' SUPPLY CO., Kansas City, Mo.
REINHARD BROTHERS, Inc., Minneapolis, Minn.
REPASS AUTOMOBILE CO., Waterloo, Ia.
CHICAGO AUTO SUPPLY HOUSE, 1349-53 Michigan Ave., Chicago, Ill.
MOTOR CAR SUPPLY CO., 1451-5 Michigan Ave., Chicago, Ill.
WESTERN MOTOR SUPPLY CO., Milwaukee, Wis.

CHANSLOR & LYON CO.
San Francisco, Seattle, Los Angeles, Tacoma, Spokane, San Diego, Portland

THE BECKLEY-RALSTON CO.
New York, Detroit, Chicago, Kansas City, Pittsburgh, San Francisco



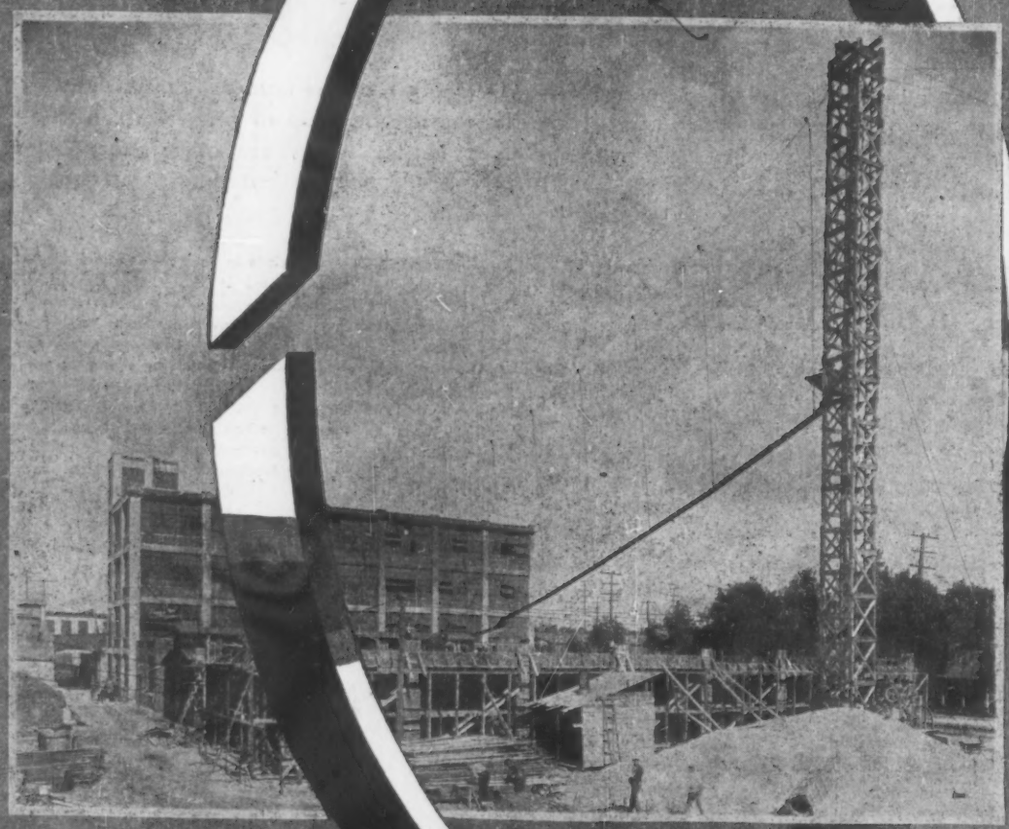




QUALITY SNAP RINGS

are Dependable for Power and Speed

An ever-increasing expansion means an ever-increasing Service



"MORE THAN A MILLION A MONTH"

THE Piston RING COMPANY

106 SANFORD ST. MUSKEGON, MICH.

GARDNER
ST. LOUIS
" IT SPEAKS FOR ITSELF "

Since 1875, nearly half a century, the Gardner organization have been manufacturing quality products at volume prices. Their motto has been "every customer must be satisfied" and their dealer body has been happy and prosperous. All of the experience, knowledge and financial strength gained during these successful years has been used in perfecting the Gardner Light Four. Dealers seeking a connection where permanency, confidence and co-operation are desired and can themselves give necessary references should get in touch with us at once for full particulars.

THE GARDNER MOTOR CO.

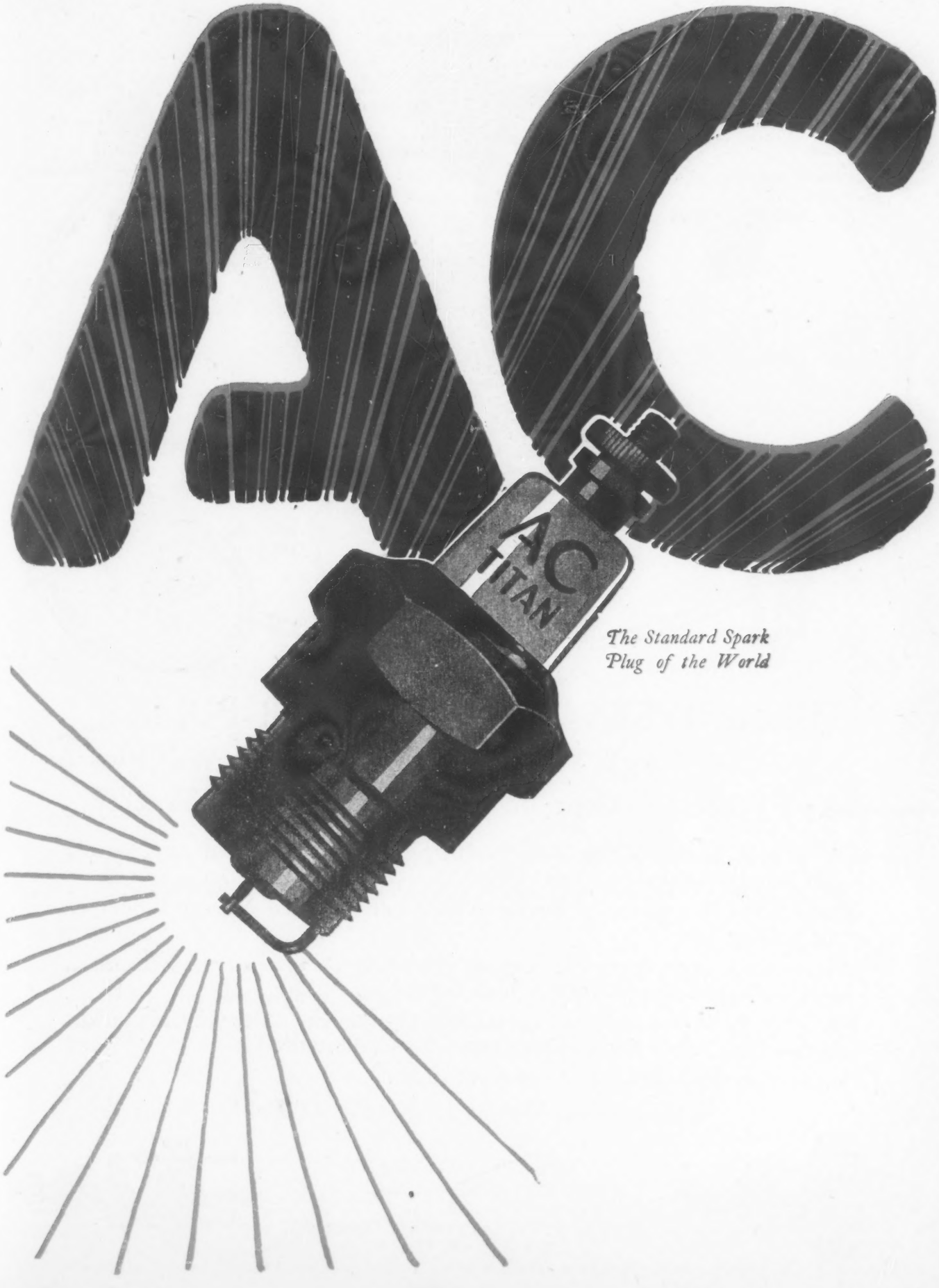
The old, old story of AC dominance was retold at this year's New York and Chicago Automobile Shows. A census taken of the passenger cars and motor trucks on display showed that more fine cars were equipped with AC Spark Plugs than with all other makes combined. The dealer takes no chances in stocking a line that has the endorsement of the leading automotive engineers of the country, or in recommending and selling spark plugs that are used as standard equipment on the leading makes of automotive vehicles. That line is the AC. Concentrate upon it. Write today for complete dealer information.

Champion Ignition Company, FLINT, *Michigan*

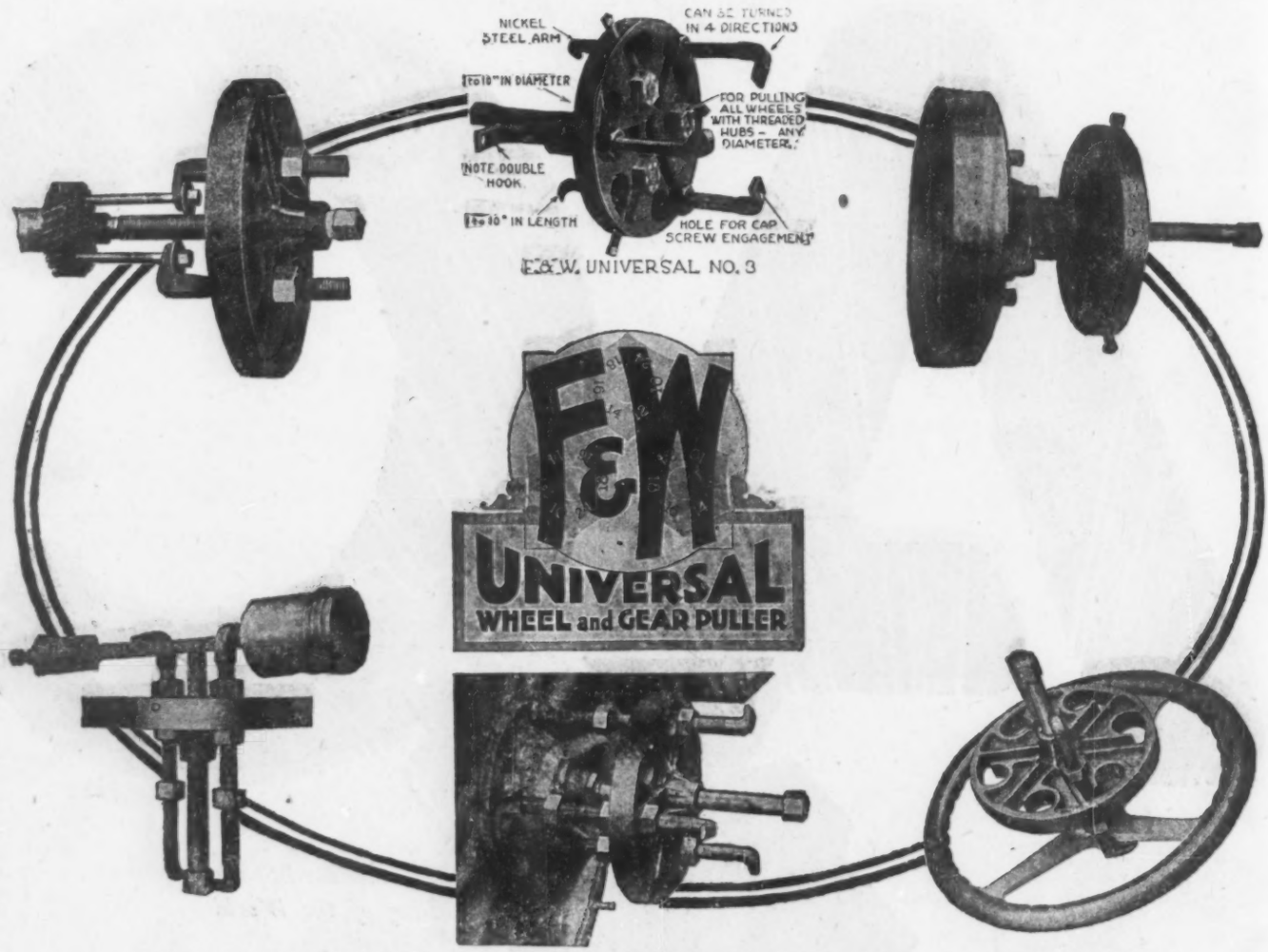
These manufacturers use AC Spark Plugs for factory equipment

Acason Trucks
Ace
Acme Trucks
Advance-Rumley Tractors
Ahrens Fox Fire Trucks
American Beauty
American-La France
Anderson
Apex Trucks
Apperson
Appleton Tractors
Argonne Four
Ateo Trucks
Auburn
Austin Mfg. Co.
Available Trucks
Avery Tractors
A & T Tractors
Bates Steel Mule Tractors
Beck-Hawkeye Trucks
Bellanger Freres (France)
Bessemer Trucks
Betz Trucks
Birch
Bour-Davis
Braddon
Bradley
Briggs & Stratton Motor Wheel (formerly Smith)
Brockway Trucks
Buffalo Motors
Buick
Bullock Creeping-Grip Tractors
Cadillac
Cameron
J. I. Case T. M. Co.
Chalmers
Chandler
Chevrolet
Chicago Trucks
Clark Tractors
Cleveland
Cole
Collier Trucks
Comet
Commonwealth
Conestoga Trucks
Continental Motors
Crane-Simplex
Curtiss Aeroplane
Daniels
Dart Trucks
Davis
Defiance Trucks
Delco-Light
Denby Trucks (Canada)
Diamond T Trucks
Diehl Trucks
Dodge Brothers
Doman Engines
Domestic Gasoline Pumping Engines
Dort
Duesenberg Motors
Dynelectric Plants
Eagle Tractors
Economy
Elmira
Essex
Excelsior Motorcycles
Fairmont Railway Motors
Federal Trucks
Flour City Tractors
Frontmobile
F-W-D Trucks
Galloway Engines
Gary Trucks
Genco Light
Glide
G. B. S. Motors
G. M. C. Trucks
Gramm-Bernstein Trucks
Gray Dort (Canada)
Hackett
Hahn Trucks
Hall Trucks
Harvey Trucks
Hatfield
Haynes
Herschell-Spillman
Holt Tractors
Howell Tractors
Hudson
Hupmobile
Hurlburt Trucks
Independent Trucks
Jackson
Johnson Motor Wheel
Jordan
Jumbo Trucks
Kalamazoo Trucks
Kearns Trucks
Kent Concrete Mixers
Kissel Kar
Kleiber Trucks
Klemm Trucks
Knox Tractors
Koehler Trucks
K-Z Trucks
Lalley-Light
Leach Power-Plus Six
Liberty
L. M. C. Trucks
Locomobile
Maccar Trucks
Maibohm
Marmon
Master Trucks
Maxim Fire Trucks
Maytag
McLaughlin (Canada)
Menominee Trucks
Meteor
Midland Trucks
Midwest Engines
Minneapolis Motors
Mitchell
Moline-Knight
Monroe
Moreland Trucks
Napoleon Trucks
Nash
National
Nelson
Nelson Tractors
Nelson & Le Moon Trucks
Netco Trucks
New Britain Tractors
Noble Trucks
Oakland
Old Reliable Trucks
Oldsmobile
Oneida Trucks
Owens Light & Power Plants
Packard
Paige
Pan
Parker Trucks
Paterson
Patriot Trucks
Peerless
Perfect Power Sprayers
Phianna
Pierce-Arrow
Pilot
Pioneer Tractors
Pittsburgher Trucks
Porter
Premier
Ranger Trucks
Red Wing Thorobred Motors
Reo
Re Vere
Reynolds Trucks
Riker Trucks
Roamer
Roberts Motors
Robinson Fire Trucks
Rock Falls
Rowe Trucks
Rutenber Motors
Samson Tractors
Sandow Trucks
Sanford Trucks
Sawyer-Massey Tractors (Canada)
Saxon
Scripps-Booth
Scripps Motors
Seagrave Fire Trucks
Signal Trucks
Singer
Speedway Motors
Standard "8"
Standard Trucks
Stanwood
Stearns-Knight
Stearns Tractors
Sterling Engines
Sterling Trucks
Stewart Trucks
Stockton Tractors
Stoughton Trucks
Straubel Engines
Sullivan Trucks
Super Trucks
Swartz Lighting Plants
S-S-E-Co.
Tiffen Trucks
Tioga Tractors
Titan Trucks
Tower Trucks
Trego Motors
Union Marine Engines
Universal Trucks
United Trucks
Van Blerck Motors
Veerac Motors
Vim Trucks
Wallace Tractors
Walter Trucks
Ward LaFrance Trucks
Wescott
White
White Hickory Trucks
Whitney Tractors
Wichita Trucks
Wilson Trucks
Wisconsin Motors
Wolverine Tractors
Woolery Ry. Motors

U. S. Pat. No. 1,135,727, April 13, 1915, U. S. Pat. No. 1,216,139, Feb. 13, 1917. Other Patents Pending.



The Standard Spark Plug of the World



THE UNIVERSAL WHEEL GEAR PULLER

Is the Only Single Tool on the Market That Will Pull Any Wheel or Gear on Any Car Truck or Tractor

The F & W is one of the most useful pieces of equipment any garage could possibly acquire.

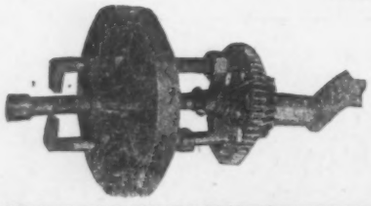
It combines in one tool a device which can be used on any wheel or gear pulling job.

It has stood every possible test on all kinds of operations without a single failure, and will fit any hub for wheel pulling.

The F & W is the only universal wheel and gear puller in the market and as a time, labor and money saver, it is unequalled.

For further information, write your jobber.

Send for our illustrated Booklet TODAY



Sales Department
THE ZINKE COMPANY
1323 S. Michigan Ave.
Manufactured by
F & W MANUFACTURING COMPANY
INDIANAPOLIS, INDIANA



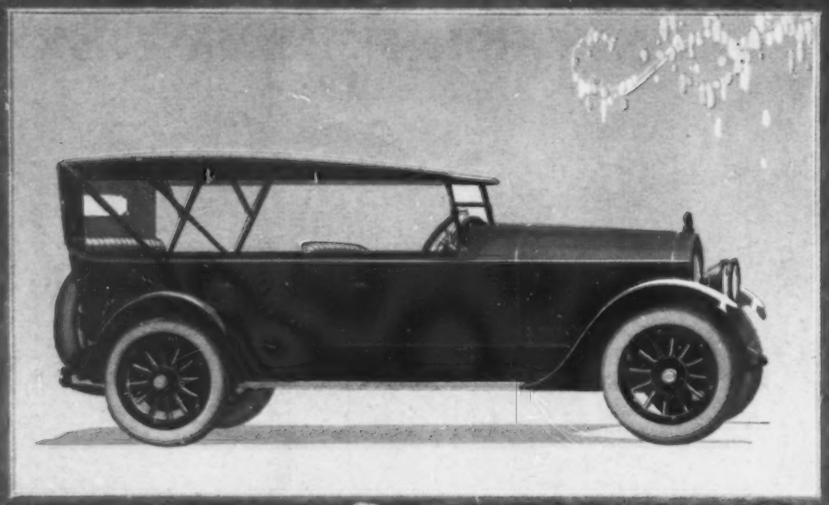
The VOGUE

IN

MOTOR CARS

for 1920

THERE'S A TOUCH OF TOMORROW
IN ALL COLE DOES TODAY



Tourster

Cole Aero-Eight

A FORECAST OF FUTURE FASHIONS
15,000 MILES ON TIRES

COLE MOTOR CAR COMPANY, INDIANAPOLIS, U.S.A.
Creators of Advanced Motor Cars

There's
A Touch of Tomorrow
In All Cole Does
Today

Four-color advertising of this character is used exclusively by Cole in more than 20 of the leading magazines and reaches over 4,000,000 people each month.

*The ONLY Aero-*EIGHT

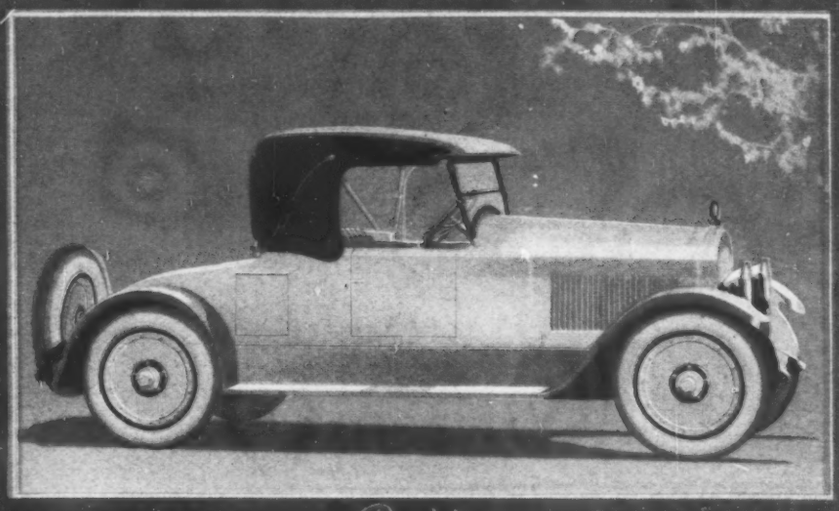
To the keen merchant, the advantage of having the *exclusive right* to sell an article of recognized worth and active demand is appreciated instantly.

But, when the article itself is an *exclusive creation*, the advantage is multiplied many times. Competition is practically eliminated.

A franchise to sell the *Aero-*EIGHT in a territory implies not only the right of *exclusive representation,* but the privilege of handling an article which is the *only one* of its kind.

For, though there are many conventional eight-cylinder cars, there is ONLY ONE *Aero-*EIGHT.

There's
A Touch of Tomorrow
In All Cole Does
Today



Roadster

Cole Aero-Eight

THE HERALD OF A NEW VOGUE
UNPARALLELED ROADABILITY

COLE MOTOR CAR COMPANY, INDIANAPOLIS, U.S.A.
Creators of Aircooled Motor Cars

Doubled Production in 1920

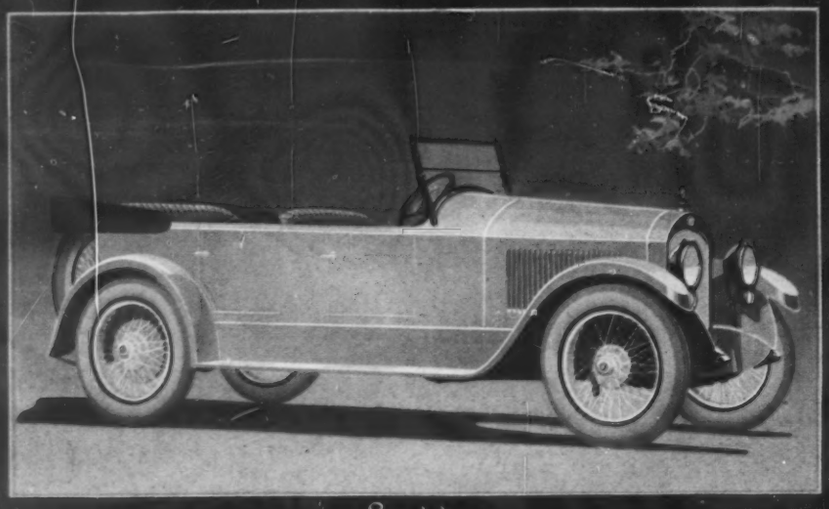
More than 8,000 *Aero*-EIGHTS are serving the needs of American motorists today, yet during the year just passed only a fraction of the demand could be supplied.

With the recent enlargement of the Cole factory to more than *twice* its former size production will be *doubled* in 1920.

Thus, many who in the past have found it impossible to procure *Aero*-EIGHTS now will be afforded the privilege of ownership.

And Cole dealers will be able to take fuller advantage of the splendid sales opportunities which the increasing demand for the *Aero*-EIGHT affords.

That touch of tomorrow which gives all that Cole does its individuality and advancement is reflected in the distinctive national advertising facsimile of which is reproduced above.



Sportster

Cole Aero-Eight

REFRESHINGLY DIFFERENT IN DESIGN
POWERFUL · SPEEDY · ECONOMICAL

COLE MOTOR CAR COMPANY, INDIANAPOLIS, U.S.A.

Creators of Advanced Motor Cars

There's
A Touch of Tomorrow
In All Cole Does
Today

Cole advertising is as distinctive, original and exclusive as the product it advertises, and appears every month of the year in 20 magazines noted for their quality appeal.

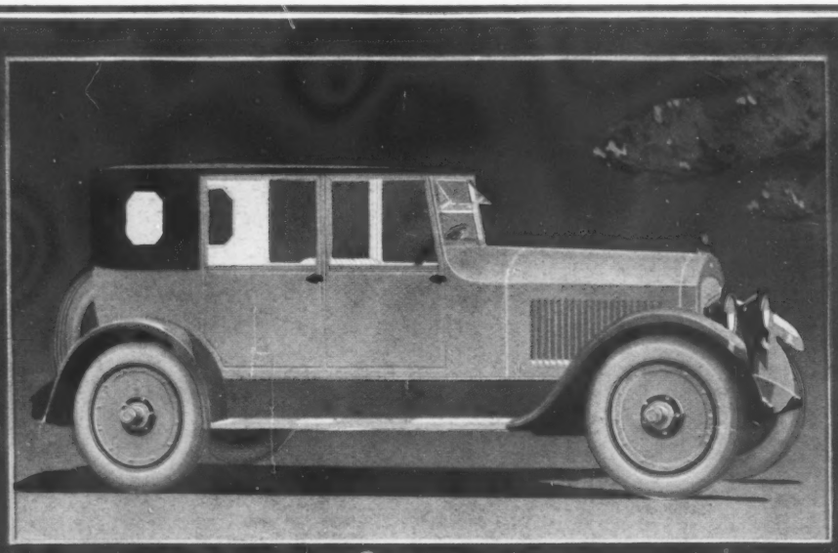
The Value of Advancement

To sense the trend of the future and to be the *first* to give it tangible expression has been the constant aim of the Cole.

Season after season—year after year, the advanced creations in motor cars offered by this company have forecast the styles of the future.

Today, the *Aero*-EIGHT is recognized universally as the sponsor of the most generally accepted style vogue the motor car industry ever has entertained.

Consequently, Cole dealers exercise a determining influence as being the *first* to afford that which others are obliged to offer eventually.



Sportsedan

There's
A Touch of Tomorrow
In All Cole Does
Today

Cole Aero-Eight

THE ORIGINAL AEROTYPE MOTOR CAR
15,000 MILES ON TIRES

COLE MOTOR CAR COMPANY, INDIANAPOLIS, U.S.A.
Creators of Advanced Motor Cars

A Line of Complete Appeal

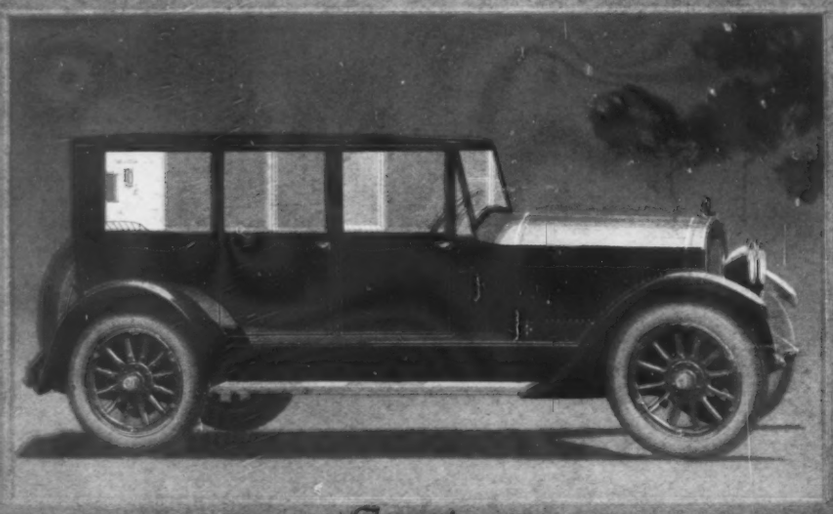
Those who sell the *Aero*-EIGHT can cater to every demand. The line is so diversified that no matter for what purpose a motor car may be desired, there is an *Aero*-EIGHT which answers the requirements.

Yet, so individual, so original are Cole creations that they stimulate a desire for ownership which will countenance no substitute.

The evident advantage to the dealer who handles the *Aero*-EIGHT is incalculable.

It is as if Cole had read the motoring mind of the nation and the *Aero*-EIGHT was the result.

More than 4,000,000 influential magazine readers are reached every month with Cole four-color advertising appearing in 20 publications of recognized worth.



Tourousine

Cole Aero-Eight

INIMITABLE NEW BODY CONCEPTIONS
UNPARALLELED RIDING COMFORT

COLE MOTOR CAR COMPANY, INDIANAPOLIS, U.S.A.

Creators of Advanced Motor Car Designs

There's
A Touch of Tomorrow
In All Cole Does
Today

The wide circulation of distinctive four-color advertising has given the Aero-EIGHT unparalleled prestige with more than 4,000,000 discriminating Americans.

*The Secret of Aero-*EIGHT *Success*

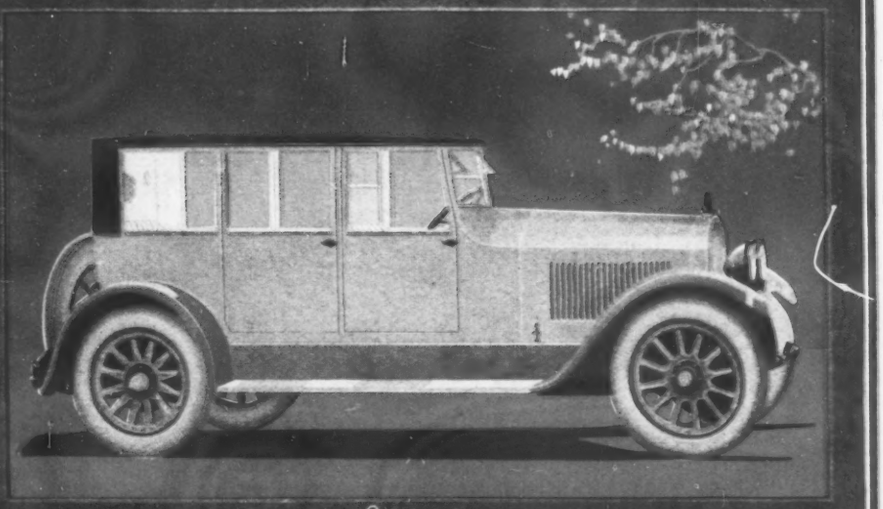
Had the *Aero-*EIGHT simply ushered in a new fashion in motor car design, its interest would have been restricted exclusively to those who seek style.

Had it offered only something new in the way of performance, its appeal would have been primarily to those who interpret motor car value in terms of speed, reserve power and economy.

Had it been known solely for its comfort and ease of control, only those would have sought it who realize that worth may be *inherent* as well as apparent.

But the *Aero-*EIGHT encompasses them all in its appeal. It satisfies completely regardless of what is made the basis of choice. That is the secret of its remarkable success.

There's
A Touch of Tomorrow
In All Cole Does
Today



Sportousine

Cole Aero-Eight

EXCLUSIVE DESIGNS-ADVANCED ENGINEERING
GREATER PERFORMANCE EFFICIENCY

COLE MOTOR CAR COMPANY, INDIANAPOLIS, U.S.A.

Creators of Advanced Motor Car Designs

The above is a miniature facsimile of one of the four-color advertisements used by Cole in more than 20 of the leading magazines of national circulation.

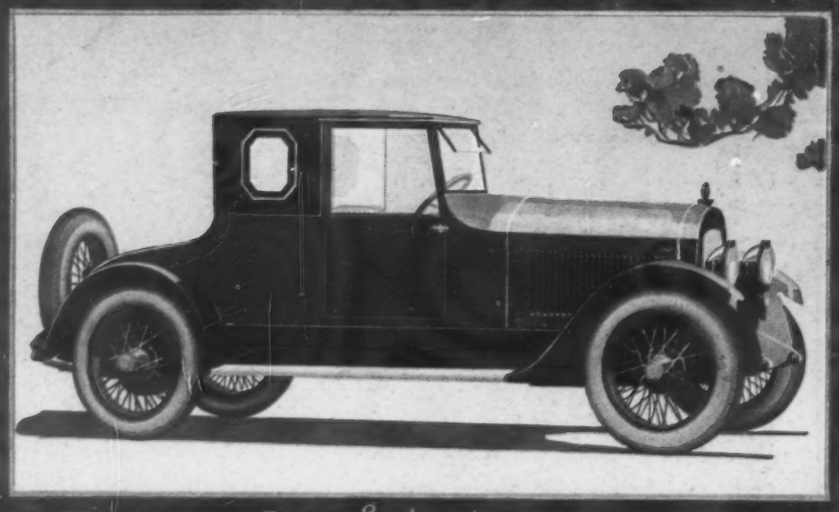
Building Business Endurance

The steady development and continual progress of the Cole has been inspiring.

From small beginnings it has become one of the real factors in the industry, offering a product which has won universal respect and admiration.

Success such as this is *permanent*. Business built up on it will endure.

This, Cole dealers realize. Their association with the Cole is a permanent investment which gives increasing revenues and multiplies in value from year to year.



Sportcoupé

Cole Aero-Eight

THE CRITERION OF MOTOR CAR FASHIONS
A NEW AUTOMOTIVE ACHIEVEMENT

COLE MOTOR CAR COMPANY, INDIANAPOLIS, U.S.A

Creators of Advanced Motor Cars

There's
A Touch of Tomorrow
In All Cole Does
Today

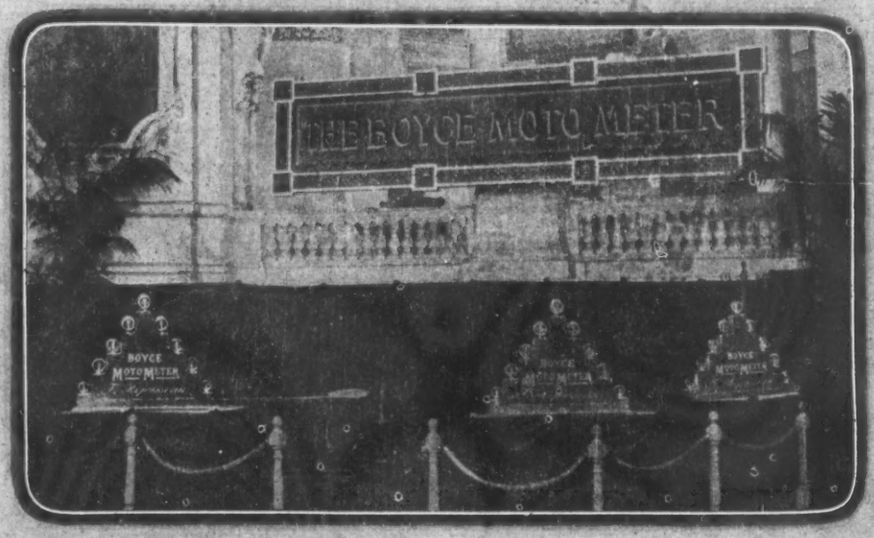
Cole four-color advertising appears in right-hand inserts and on covers of 20 of the leading class and quality publications of the country.

Some Opportunities Still Exist

With its dealer organization encompassing almost every community of consequence in the United States and Canada, and its foreign representation encircling the globe, the Cole has acquired wide distribution.

Seeking always to better the facilities which it is able to assure Cole owners, however, the company is eager always to consider all opportunities to improve its relations with those who own and drive Cole cars.

Dealers of recognized ability and integrity are encouraged to let us hear from them. For though an opening in their territories may not exist immediately, it may develop later.

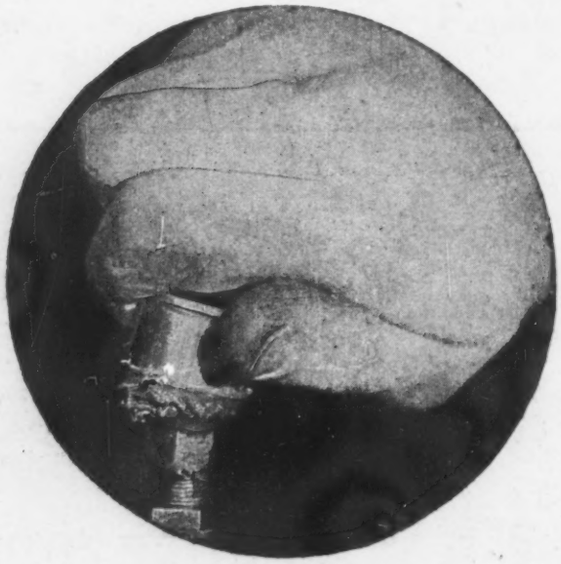


A "WORLD WIDE" ACCESSORY

The striking exhibit of Boyce Moto-Meters at the Paris Automobile Show is evidence of the growing popularity all over the world of the most necessary instrument on the modern Automobile . .

BOYCE MOTO METER





Your customers are dissatisfied with their old style grease cups

The grease oozes out
Screw threads get crossed and stuck
"Greasing up" is a mean, dirty job

"A GREASY, grimy, irksome job"—that's what the average car-owner thinks about ordinary grease cups.

Here's a source of dissatisfaction that you can turn into *service for customers and profits for yourself.*

Eliminate the troubles a motorist has had with his grease cups, and you've gone a long way toward getting his good-will.

The nuisance of the old style cup

When the man who runs his own car thinks of "greasing up," he thinks of grease oozing out between the threads—of grease smeared all over his hands—of grease under his finger-nails that stays there for days.

It's mean work—"struggling" to unscrew the top—using pliers—plastering in the grease from a dirty can or bucket—trying to replace the top without getting the screw threads crossed.

Yet in spite of all the bother, *in nine cases out of ten the grease doesn't get to the bearing properly.*

Why a bearing needs a high pressure of grease

Perfect lubrication means that grease must be forced *to the actual bearing surface.* This requires that a pressure be developed by screwing down the top of the cup. But with the ordinary cup most of the motorist's effort is lost in the friction between the screw threads, and there is little pressure *on the grease.*

Car-owners simply *will not* be bothered with filling their grease cups. The result is that there are hundreds of thousands of cars with worn, dirt-clogged bearings, and squeaking steering gears and spring shackle bolts.

The whole process from beginning to end is clumsy, inefficient, and disagreeable. Motorists today are sick and tired of the dirty, mean job of "greasing up" with the old style cup. Any new cup that will do away with this nuisance is bound to be one of the biggest selling accessories—*bar none!*



Everyone who sees these new cups wants to buy them at once

How any dealer can capitalize the difficulties car owners are having

AT LAST! A grease cup that actually eliminates all the nuisance of "greasing up!"

Clean! Quick! Convenient to fill! That's the new Searing Grease Cup that is today being adopted by thousands of car owners in all parts of the United States, that is being put on more and more of the 1920 cars.

No bulk grease at all! Fresh, handy, waxed paper *grease cartridges* take the place of the old-fashioned can or bucket of grease.

No muss! No screw threads to get stuck! No time wasted! Perfect lubrication! A real economy!

Dealers and car owners enthusiastic

"You win," writes one user. "I have tried every grease cup on the market, and when I get yours I am going to throw them all away."

"Wish you would get some one here to handle them," says a car owner in a small town in Texas, "as they are the only cups I have used that are worth having."

It takes only a second to fill the Searing Grease Cup. A slight twist removes the cover. You drop in a Searing Grease Cartridge, snap on the cover again—and the trick's done. A few easy turns on a thumb screw (not the old style screw cap) forces the grease to the bearing *with a pressure of more than 600 pounds.*

Any car can be equipped

The Searing Grease Cup is made to fit any car having standard size connections. For cars that do not have connections of this size the necessary adapters are furnished at 10c each.

Put in a stock of Searing Grease Cups today. Display them prominently in your store. Tie up to the national consumer advertising campaign in the Saturday Evening Post and the Literary Digest, a combined circulation of more than 3,000,000. Let the cups sell themselves to your customers.

Your jobber already has Searing Grease Cups and Grease Cartridges in stock, or can get them for you in a few days. Write or wire him at once for a supply. Full profit to the trade.

LIST PRICES

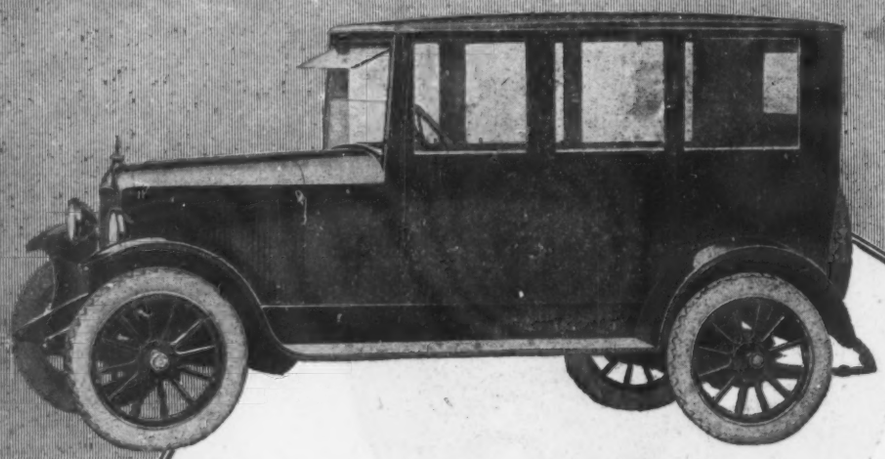
Cups each 50c
Cartridges, box of 20—25c

PACIFIC COAST TERRITORY

Cups, each 65c
Cartridges, box of 20—30c

Pacific Coast Distributors:
U. S. MANUFACTURERS SALES CO., Portland, Ore.

Manufactured by
THE LEWIS SEARING COMPANY
of Michigan
DETROIT, MICHIGAN



The Leader of Light-Weight Cars

BRISCOE

A Wonder-Car!

The Verdict of Thousands Who Saw It At the New York Show

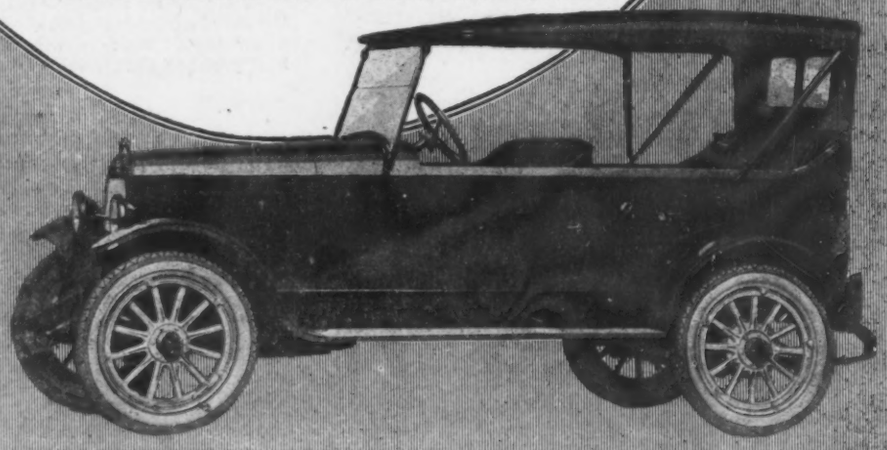
From both a mechanical and artistic standpoint the 1920 Briscoe has scored a distinct hit.

The clean-cut chassis, giving one the impression of a sturdy athlete stripped for action; the compact unit power-plant, emphasizing the features that have made Briscoe economy world-famous; the beautiful, distinctive body-lines, worthy of the highest-priced car built—these and a score of other features demonstrated Briscoe dominance in the light-car field.

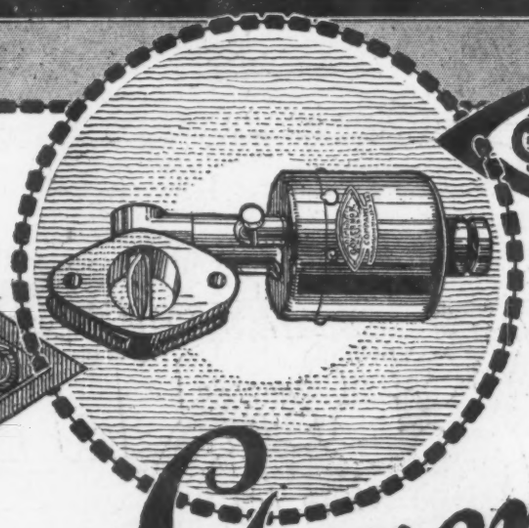
See the three models—sedan, coupe and touring car. They are worth your careful study.

BRISCOE MOTOR CORPORATION
JACKSON, MICHIGAN

The Canadian Briscoe Motor Company, Limited, Brockville, Ontario



The Leader of Light-Weight Cars



DIAMOND T

Pierce Governors

ALWAYS LINKED WITH THE BEST MAKES OF MOTOR TRUCKS

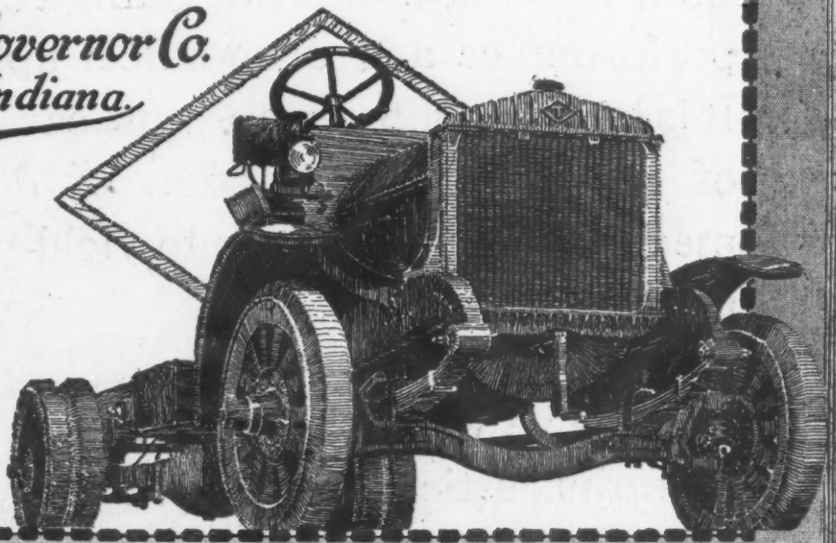
THE Diamond T is only one among ninety-seven prominent makes of Motor Trucks on which Pierce Governors are standard equipment.

Truck Manufacturers who let quality and not price guide them in the selection of units for their trucks, do not buy governors until their Engineers have given the different types the most gruelling and exacting competitive tests possible.

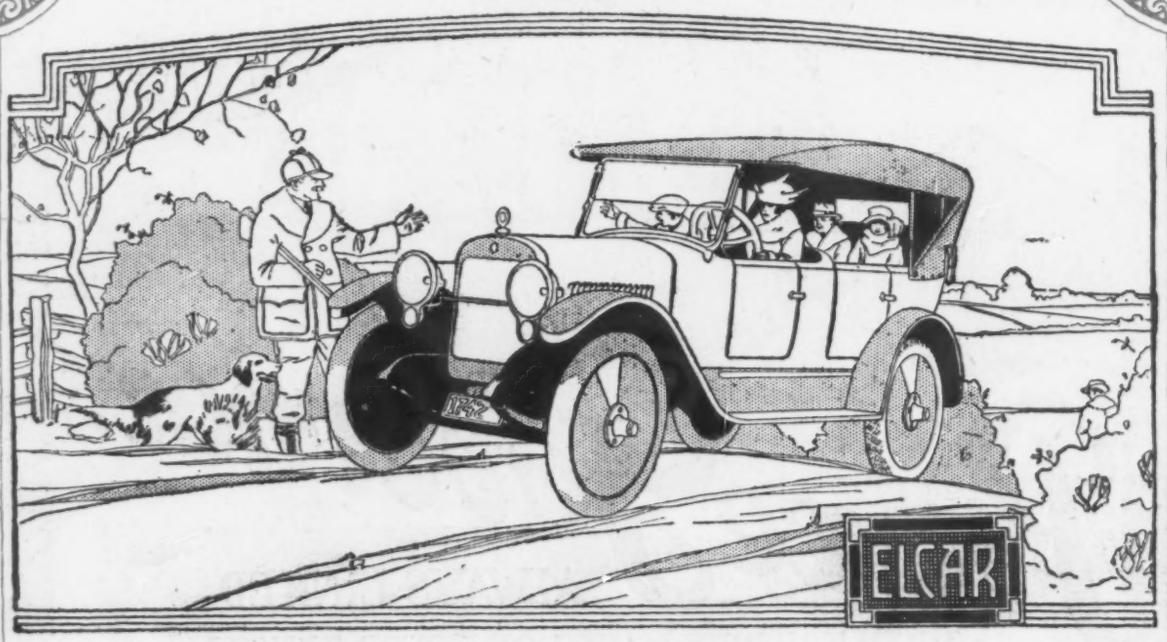
As a result of such tests, more Truck Manufacturers are today using Pierce Governors than all other makes of governors combined. Pierce Governors are superior—**always.**

The Pierce Governor Co.
Anderson, Indiana

WORLD'S LARGEST GOVERNOR BUILDERS



ELCAR



The Elcar—EIGHT Practical Models

THE ELCAR appeals to those who have intimate knowledge of automobile construction, who know on what riding comfort, perfect performance and economical upkeep depends. It is built for those who want cars of ample size, of beauty and distinction of design, and so mechanically perfect as to yield years of exacting service.

For twelve years the ELCAR has been gaining in enthusiastic appreciation and keeping all it

(Continued on next page)

ELCAR

has gained. Back of it is half a century of quality vehicle building. The 1920 line includes.

The Elcar, Four Fours—Four Sixes

The Fours and Sixes are alike except as to motors. The ELCAR-Lycoming Motor in the Fours; the 7-R Red Seal Continental in the Sixes. 116 inches wheel base. Delco starting, lighting and ignition. Stromberg carburetor. Berg & Beck ten-inch dry plate clutch. New Salisbury pressed steel rear axle. Luxurious upholstery. Equipment complete. Write for catalog giving the complete story of this exceptional car.

PRICES

Five-Passenger Touring	4-Cylinder, $1395.00	6-Cylinder, $1595.00
Four-Passenger Sportster	4-Cylinder, $1395.00	6-Cylinder, $1595.00
Three-Passenger Coupe	4-Cylinder, $1995.00	6-Cylinder, $2195.00
Five-Passenger Sedan	4-Cylinder, $2095.00	6-Cylinder, $2295.00

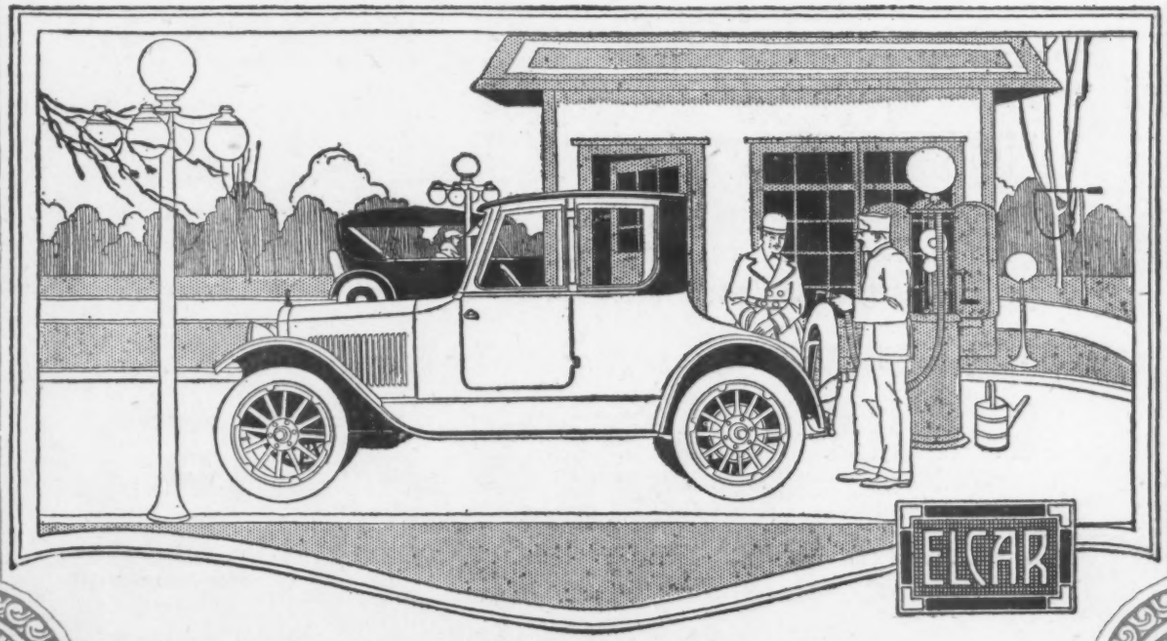
F. O. B. Elkhart.

DEALERS who are in position to give the Elcar the active representation it deserves, should communicate at once.

ELKHART CARRIAGE & MOTOR CAR CO.,

ELKHART, INDIANA

Builders of Fine Vehicles Since 1873.



Akron-Williams

Announces improvements and new equipment for tire repairing

AGAIN Akron-Williams anticipates the requirements of the industry.

We have always pioneered in perfecting and building better and safer tire machinery, and are preparing to offer to the trade several new developments which have never been brought out before.

These are merely added evidence of the way in which Akron-Williams engineers keep pace with the growth and demands of the tire industry. They meet fully the changing conditions of state laws and business demands. They result from our years of experience in equipping some of the largest tire factories in America and thousands of successful tire repair plants, and our intimate association with the changing requirements and needs of the tire repairing business.

If you are thinking of establishing a tire repair business or are considering remodeling or extending your present facilities, write us.

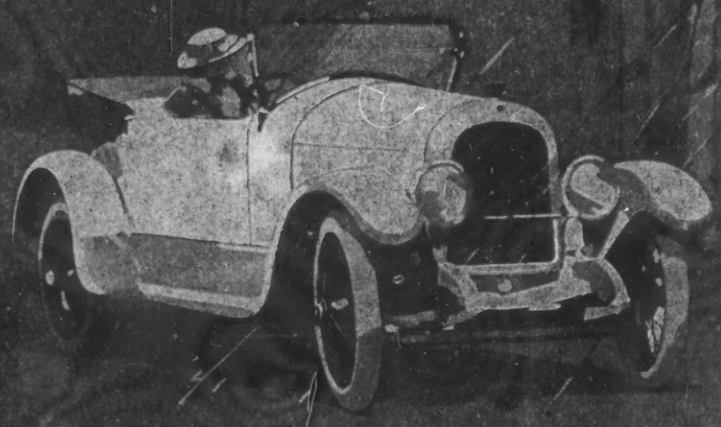
Let us help you. We will gladly co-operate and advise the correct apparatus for you to use for safety economy and efficiency.

The Williams Foundry & Machine Company

Everything for the Tire Builder and Repair Man

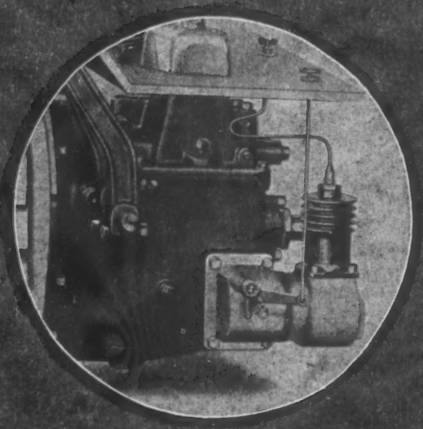
Akron, Ohio, U. S. A.

KELLOGG
Engine Driven
Tire Pump



IDEALS

In making their cars "exclusive," in adding the ingenious touch of a body artist, in simplicity and gracefulness of design and perfection in mechanical parts—manufacturers are today placing at the disposal of their customers FINISHED motor cars that closely approach the ideal.



Equally gratifying is the acceptance as "STANDARD EQUIPMENT" of Kellogg Engine Driven Tire Pump Equipment by America's and Europe's manufacturers of fine motor cars.

Kellogg Manufacturing Company
Rochester New York

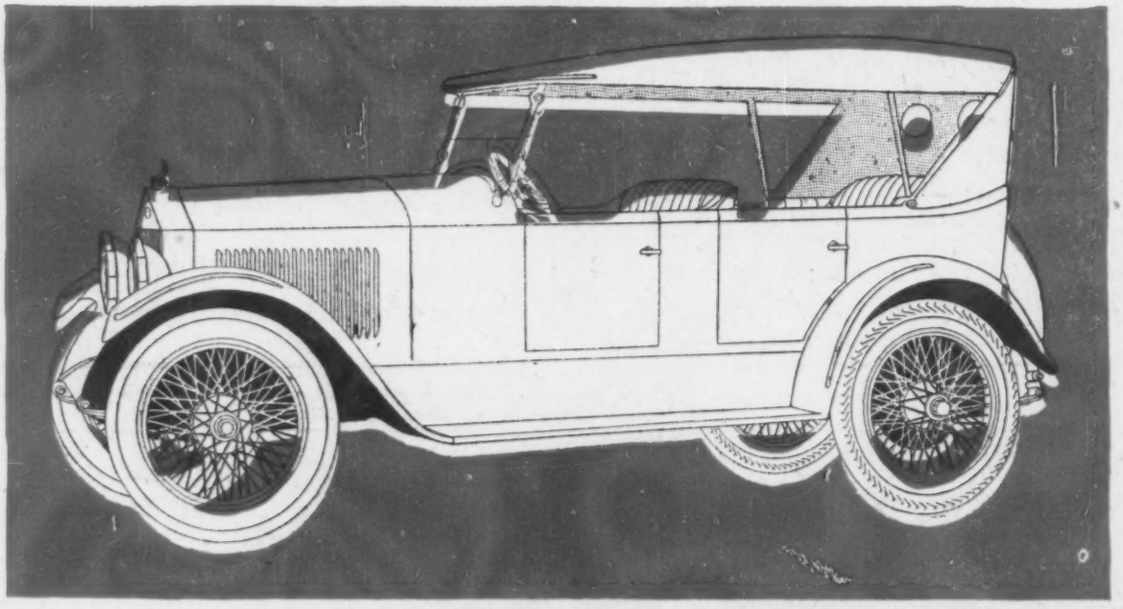
MOON

MODERN MOTOR CARS

Out amid the full production of restored industry is the Moon—the car that catches and holds attention. The touring car models—the five passenger Six-48 and the seven passenger Six-68—full-powered with Red Seal Moon-Continental Motors, effective moving units of perfected parts, designed with artistry for beauty and grace, they stand as illuminating appeals to reason because of both service and price.

We shall exhibit at the Chicago Automobile Show, Coliseum and First Regiment Armory, January 24 to 31.

MOON MOTOR CAR CO., St. Louis, U. S. A.





Here's the polish that thousands of dealers use on their demonstrators

Waxit *"The Perfect Polish"*



That's the wonderful endorsement of WAXIT! It's easy to use—and it's safe and sure.

Simply moisten cloth and apply lightly. Cleans and polishes in one quick operation without hard rubbing. Leaves the surface clean. Goes a long ways.

WAXIT prevents checking and keeps the finish like new. In thousands of homes nothing else is allowed on the piano and fine furniture.

If your dealer can't supply you with WAXIT, send his name and 10 cents for trial package. Use the coupon.

Dealers: **No other polish makes friends like Waxit. Every bottle sold starts a circle of users. Write for full size package and our proposition to dealers.**

WAXIT MFG. CO.
1671 Plymouth Bldg., Minneapolis, Minn.

WAXIT MFG. CO., 1671 Plymouth Building, Minneapolis
Kindly send me sample bottle of Waxit, for which I am enclosing 10 cents. My dealer's name is:

Name.....
Address.....
City..... State.....

THE DEPENDABLE TRUCK will be exhibited at the Chicago Automobile Show at the International Amphitheater in Space G-3.



DEPENDABLE uses Buda Motor, Wisconsin Worm Drive Axle, Dixie Magneto with impulse starter, Fuller Transmission, Long Radiators, Ross Steering Gear, Pierce Governor, Timken Bearings and Morse Viscometer.

DEPENDABLE—The Better Truck

There is always some one object which dominates its class — something which receives the stamp of public approval from the first.

Sometimes it's art—a wonderful picture from a master's brush, or a book from an inspired pen.

The world sees and applauds.

Or, some mortal conceives a city.

Skyscrapers go up, railroads are built around it. And again the multitudes acclaim, "Well done."

And so, there is always some one thing bigger than all others, winning public favor instantly with a character that sells itself—standing out on the horizon of successful achievement.

Just now it's a truck—DEPENDABLE—"THE BETTER TRUCK."

It will be of financial benefit for dealers to become acquainted with Dependable Trucks.

Dependable Truck & Tractor Co.

GALESBURG ILLINOIS

SPARK F.M.C. PLUGS



Assembling the Two Parts of the F.M.C. Super Spark Plug

The F. M. C.
Hand-Made, Super Spark Plug

Is All-Mica Insulated. It Will Not Crack, Leak or Break. It is Dependable, Durable and Reliable

Your customers will always ask for the F.M.C. Super Spark Plug after they have put in their first set. The F.M.C. Plug reduces the high cost of doing business, because it eliminates the necessity of investing money in a wide assortment of "substitute" plugs.

The F. M. C. Super Spark Plug is practically made by hand. The best mica obtainable—Ruby Brazilian—is used to insulate the plug. The mica core insulation is extra thick, thus adding to the reliability and durability of the plug.

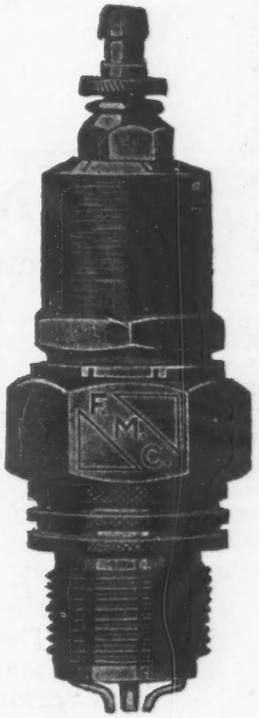
There are only two parts, each readily cleaned. The mica core insulation can be scraped, if necessary, to remove carbon deposits. Carbon and oil, however, must accumulate in very large quantities before they can affect the functioning of this plug as the chamber is extra large.

The F.M.C. Super Spark Plug must be SEEN to be appreciated. Samples will be sent upon request.

Write or Wire Now for Our Attractive Sales Plan.
A number of desirable sales territories are still open.

The F. M. C. SPARK PLUG, 14 Christopher St., New York, N.Y.

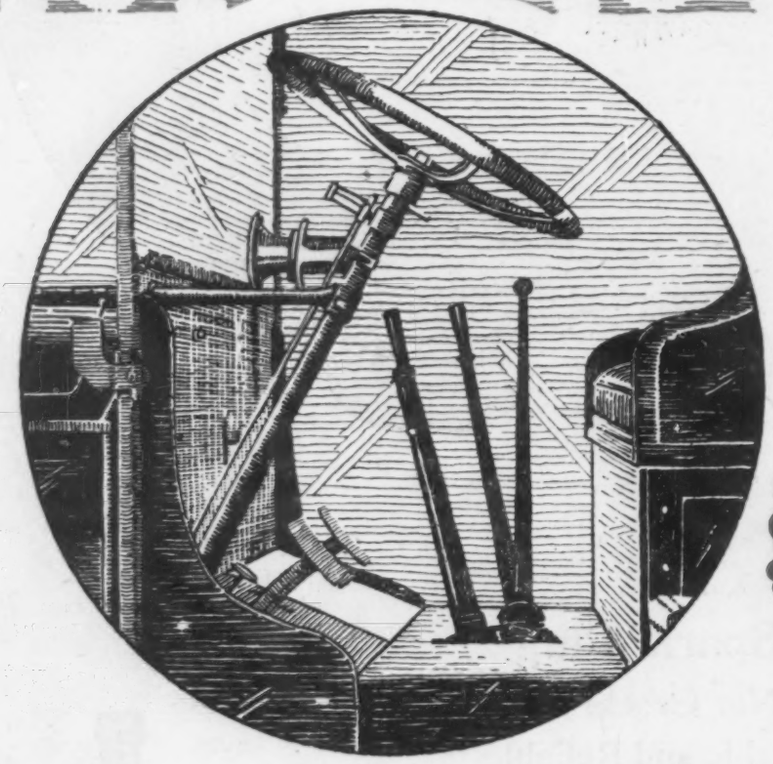
Made by the Ford Mica Company, Inc.



The Plug Without Porcelain

THE F M C SPARK PLUG

SPEED SPEED SPEED SPEED SPEED SPEED SPEED



The SCHACHT TEN SPEED TRANSMISSION

The Latest and Greatest Advance in Motor Truck Engineering

The merit of a motor truck lies in its ability to move big loads AT SPEED

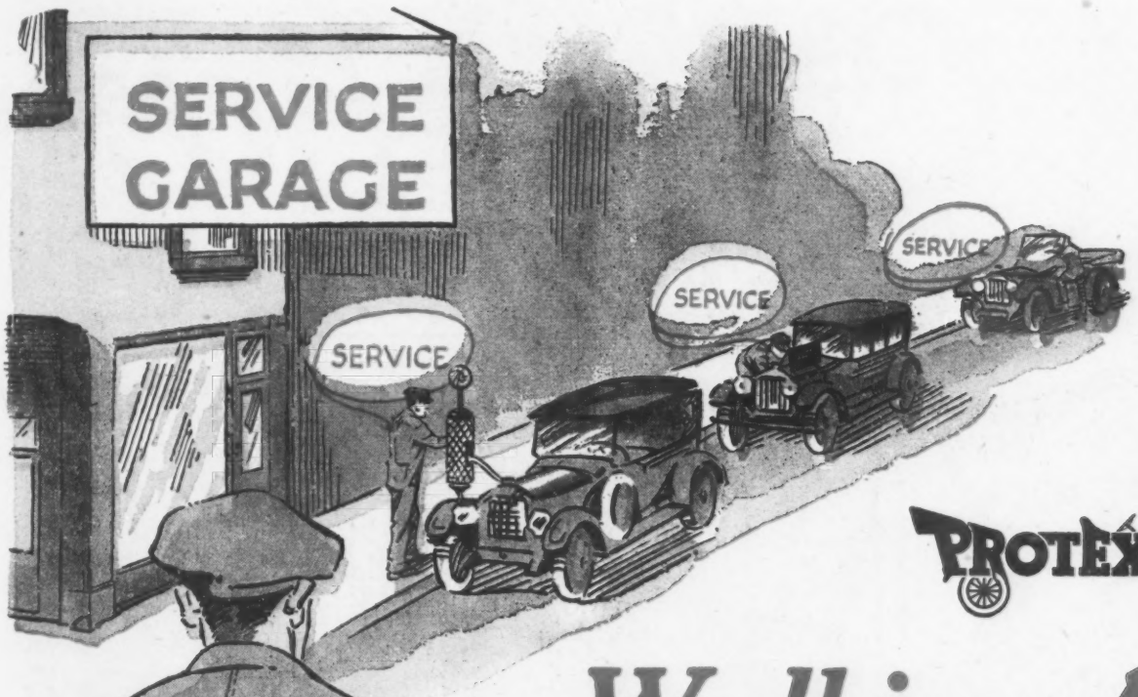
SPEED then, is essential, although this must be accomplished without causing an undue strain on the motor or other chassis parts, as has been the case in the average heavy duty truck in the past.

The "Schacht" ten speed transmission, designed expressly for "Schacht" heavy duty trucks will permit a speed of twenty to twenty-five miles per hour at 1000 R.P.M. of engine speed. It will enable the truck to do twice as much work in a given time at a lower cost of operation and with less wear and tear on engine and chassis. More power is available on the lower gears. You can expect the "Schacht" truck with ten speed transmission to go wherever the wheels can get traction.

DEALERS—Think of the selling possibilities of "Schacht" trucks. Write for all the facts—but wire for your territory reservation.

THE G. A. SCHACHT MOTOR TRUCK COMPANY
Cincinnati, Ohio

SPEED SPEED SPEED SPEED SPEED SPEED SPEED



PROTEXALL

Walking Ads

—That's what every one of your men are when they wear Protexall suits with your NAME ON THE BACK.

The name isn't printed on or put on with cut-out letters that come off and get out of shape in the washing—but are sewed right into the garment with thread of fast color. A snappy effect.

To get the name on back costs surprisingly little. It makes folks feel you're live and up-to-date. We can copy any special letter or trade mark design.

Capitalize *your* firm name by putting it on the backs of the men in your service.

Protexall jobbers and dealers all take orders for Protexalls with name on back.



Protexall One Piece Overalls Lead For Comfort, Service, Economy

They have the exclusive SPRING BACK. When you bend, Protexalls give. They give freedom of movement. They are highest grade Government Khaki; all seams double stitched and felled. Sold always in individual cartons.

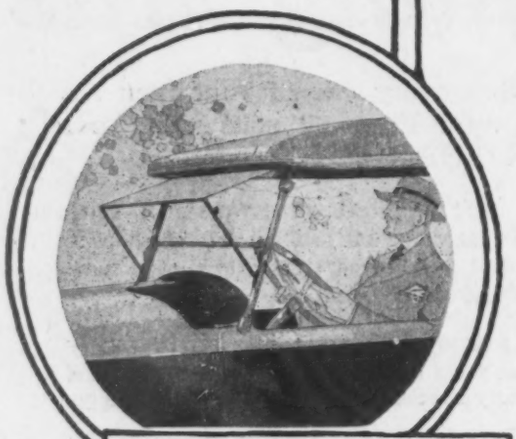
Dealers—Investigate Protexalls—their special features—and the walking ad service. Sold by exclusive jobbers. Write us if you don't know yours.

THE PROTEXALL COMPANY
Abingdon, Illinois

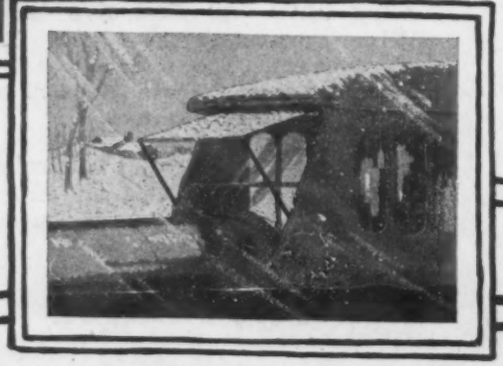
Clear Views
STORM and SUN SHIELD

In Rain or Shine, It's Needed

Regardless of weather conditions, bright, glaring sun, a heavy downpour of rain, or a blinding snow storm, Clear Views Storm and Sun Shield add safety and comfort to driving. Clear Views may be adjusted at any angle—may be pulled down to any desired point. Drivers' eyes are protected from sun glare, and in bad weather Clear Views keep a broad strip the width of the windshield free from snow or rain. Clear Views may be rolled up like a window shade when not in use. They add a touch of refinement to any motor car—are constructed of heavy specially made fabric and will last indefinitely. Can be attached by anyone in a few minutes.

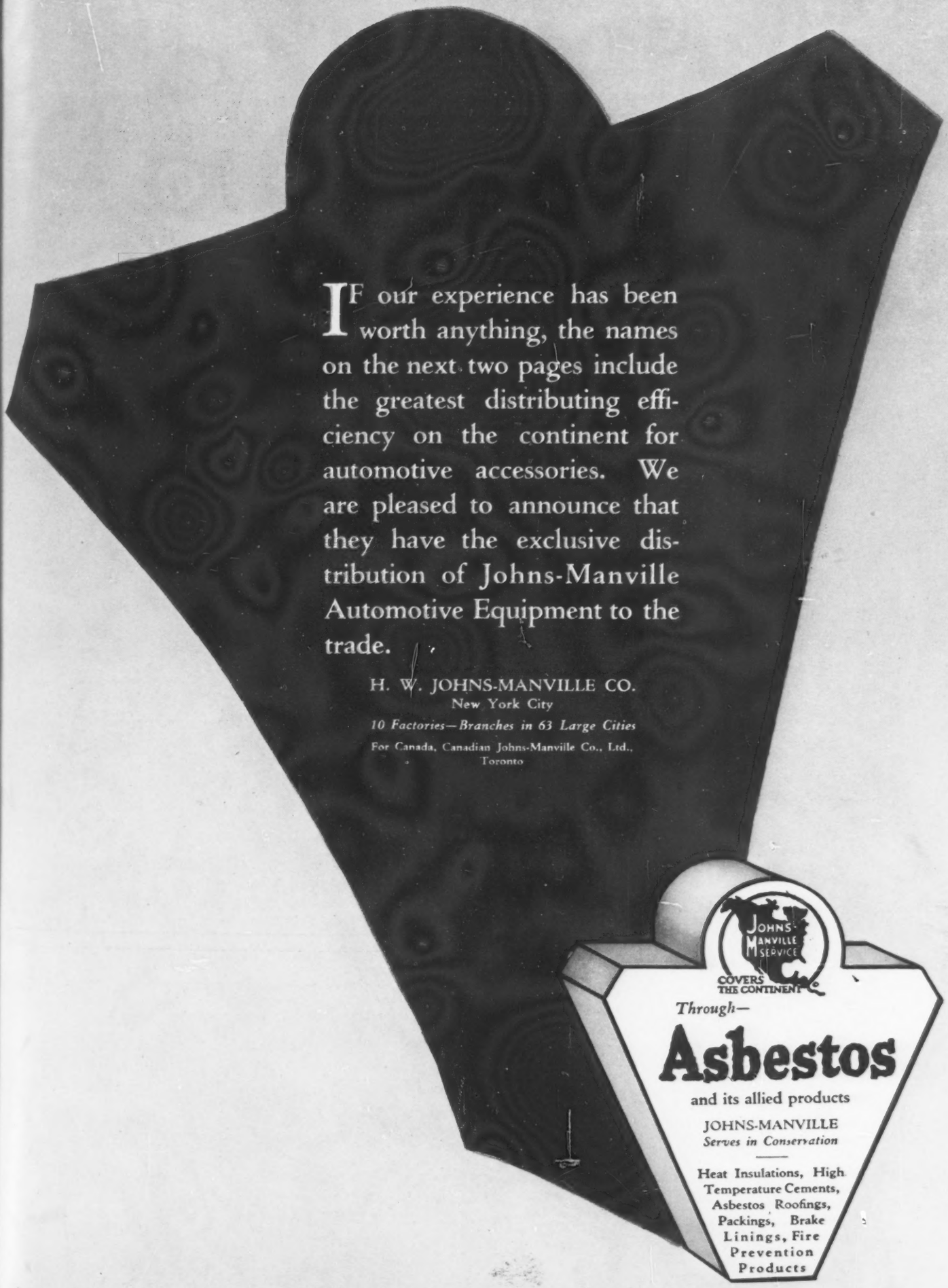


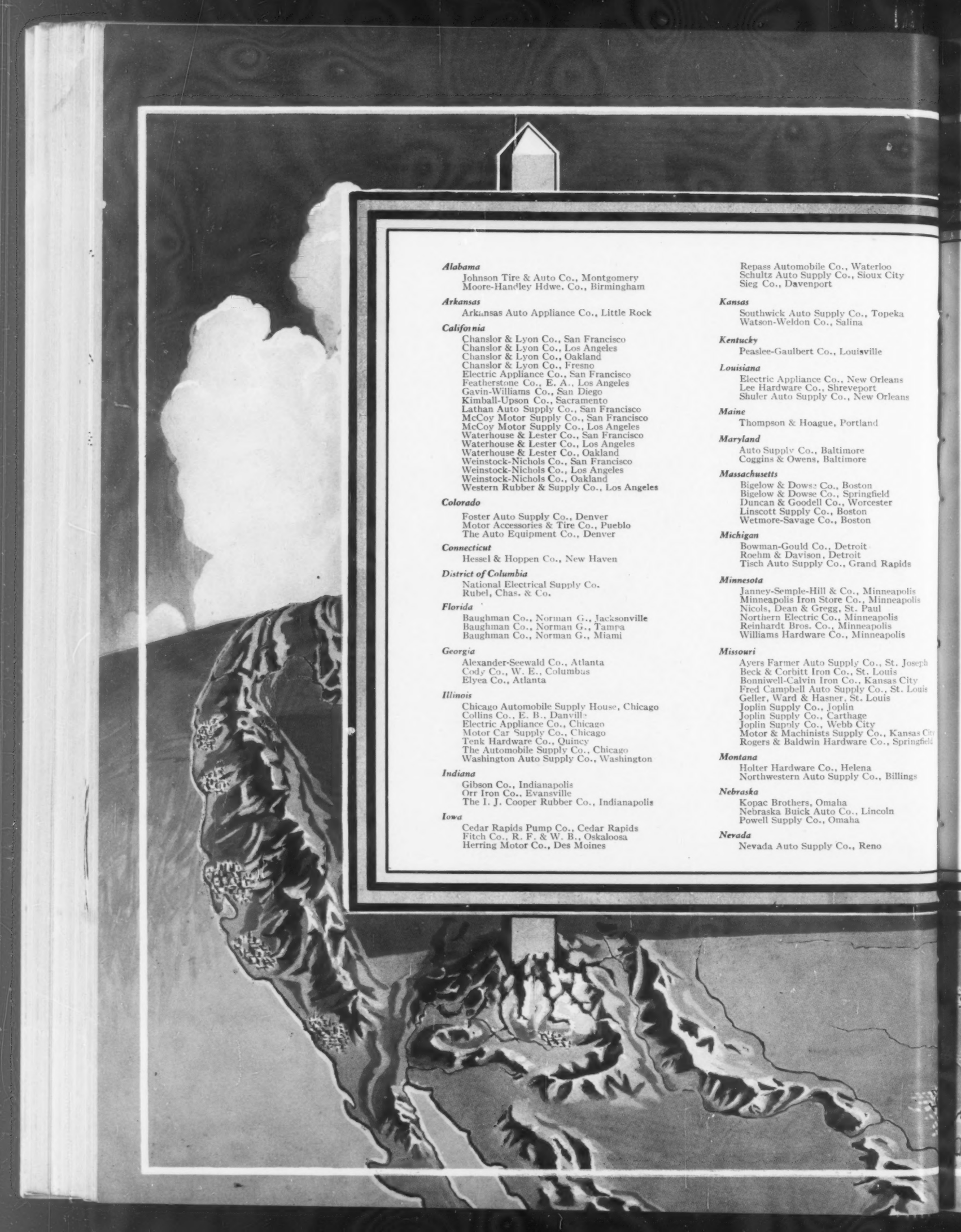




Clear Views in doing a practical work, meets a real demand. Write for dealer proposition.

WRIGHT MANUFACTURING CO.,
916 Nicollet Avenue Minneapolis, Minn.


IF our experience has been worth anything, the names on the next two pages include the greatest distributing efficiency on the continent for automotive accessories. We are pleased to announce that they have the exclusive distribution of Johns-Manville Automotive Equipment to the trade.
H. W. JOHNS-MANVILLE CO.
New York City
10 Factories—Branches in 63 Large Cities
For Canada, Canadian Johns-Manville Co., Ltd., Toronto
JOHNS-MANVILLE SERVICE
COVERS THE CONTINENT
Through—
Asbestos
and its allied products
JOHNS-MANVILLE
Serves in Conservation
Heat Insulations, High Temperature Cements, Asbestos Roofings, Packings, Brake Linings, Fire Prevention Products



Alabama
Johnson Tire & Auto Co., Montgomery
Moore-Handley Hdwe. Co., Birmingham

Arkansas
Arkansas Auto Appliance Co., Little Rock

California
Chanslor & Lyon Co., San Francisco
Chanslor & Lyon Co., Los Angeles
Chanslor & Lyon Co., Oakland
Chanslor & Lyon Co., Fresno
Electric Appliance Co., San Francisco
Featherstone Co., E. A., Los Angeles
Gavin-Williams Co., San Diego
Kimball-Upson Co., Sacramento
Lathan Auto Supply Co., San Francisco
McCoy Motor Supply Co., San Francisco
McCoy Motor Supply Co., Los Angeles
Waterhouse & Lester Co., San Francisco
Waterhouse & Lester Co., Los Angeles
Waterhouse & Lester Co., Oakland
Weinstock-Nichols Co., San Francisco
Weinstock-Nichols Co., Los Angeles
Weinstock-Nichols Co., Oakland
Western Rubber & Supply Co., Los Angeles

Colorado
Foster Auto Supply Co., Denver
Motor Accessories & Tire Co., Pueblo
The Auto Equipment Co., Denver

Connecticut
Hessel & Hoppen Co., New Haven

District of Columbia
National Electrical Supply Co.
Rubel, Chas. & Co.

Florida
Baughman Co., Norman G., Jacksonville
Baughman Co., Norman G., Tampa
Baughman Co., Norman G., Miami

Georgia
Alexander-Seewald Co., Atlanta
Cody Co., W. E., Columbus
Elyea Co., Atlanta

Illinois
Chicago Automobile Supply House, Chicago
Collins Co., E. B., Danville
Electric Appliance Co., Chicago
Motor Car Supply Co., Chicago
Tenk Hardware Co., Quincy
The Automobile Supply Co., Chicago
Washington Auto Supply Co., Washington

Indiana
Gibson Co., Indianapolis
Orr Iron Co., Evansville
The I. J. Cooper Rubber Co., Indianapolis

Iowa
Cedar Rapids Pump Co., Cedar Rapids
Fitch Co., R. F. & W. B., Oskaloosa
Herring Motor Co., Des Moines
Repass Automobile Co., Waterloo
Schultz Auto Supply Co., Sioux City
Sieg Co., Davenport

Kansas
Southwick Auto Supply Co., Topeka
Watson-Weldon Co., Salina

Kentucky
Peaslee-Gaulbert Co., Louisville

Louisiana
Electric Appliance Co., New Orleans
Lee Hardware Co., Shreveport
Shuler Auto Supply Co., New Orleans

Maine
Thompson & Hoague, Portland

Maryland
Auto Supply Co., Baltimore
Coggins & Owens, Baltimore

Massachusetts
Bigelow & Dowse Co., Boston
Bigelow & Dowse Co., Springfield
Duncan & Goodell Co., Worcester
Linscott Supply Co., Boston
Wetmore-Savage Co., Boston

Michigan
Bowman-Gould Co., Detroit
Roehm & Davison, Detroit
Tisch Auto Supply Co., Grand Rapids

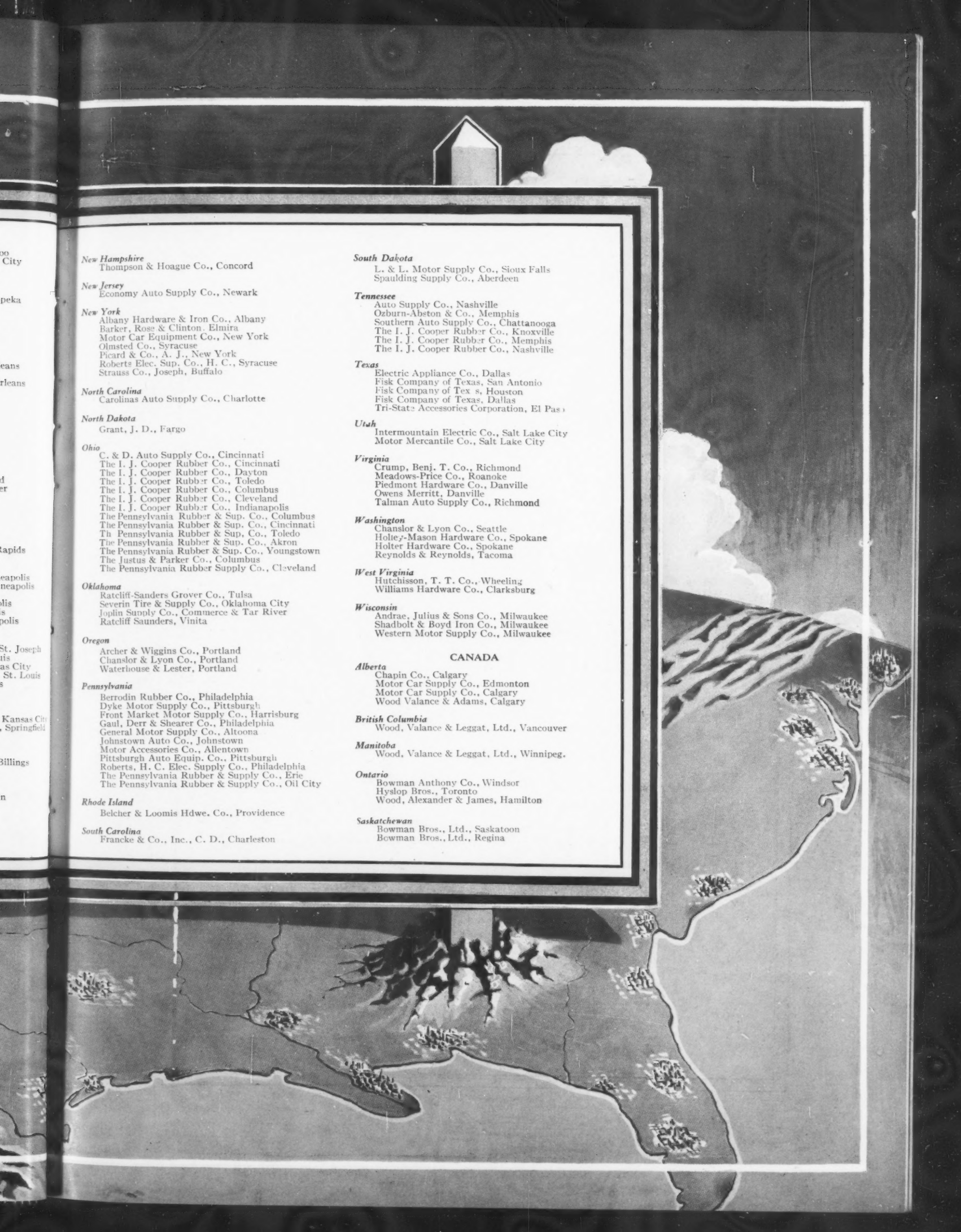
Minnesota
Janney-Semple-Hill & Co., Minneapolis
Minneapolis Iron Store Co., Minneapolis
Nicols, Dean & Gregg, St. Paul
Northern Electric Co., Minneapolis
Reinhardt Bros. Co., Minneapolis
Williams Hardware Co., Minneapolis

Missouri
Ayers Farmer Auto Supply Co., St. Joseph
Beck & Corbitt Iron Co., St. Louis
Bonniwell-Calvin Iron Co., Kansas City
Fred Campbell Auto Supply Co., St. Louis
Geller, Ward & Hasner, St. Louis
Joplin Supply Co., Joplin
Joplin Supply Co., Carthage
Joplin Supply Co., Webb City
Motor & Machinists Supply Co., Kansas City
Rogers & Baldwin Hardware Co., Springfield

Montana
Holter Hardware Co., Helena
Northwestern Auto Supply Co., Billings

Nebraska
Kopac Brothers, Omaha
Nebraska Buick Auto Co., Lincoln
Powell Supply Co., Omaha

Nevada
Nevada Auto Supply Co., Reno



New Hampshire
Thompson & Hoague Co., Concord

New Jersey
Economy Auto Supply Co., Newark

New York
Albany Hardware & Iron Co., Albany
Barker, Rose & Clinton, Elmira
Motor Car Equipment Co., New York
Olmsted Co., Syracuse
Picard & Co., A. J., New York
Roberts Elec. Sup. Co., H. C., Syracuse
Strauss Co., Joseph, Buffalo

North Carolina
Carolinas Auto Supply Co., Charlotte

North Dakota
Grant, J. D., Fargo

Ohio
C. & D. Auto Supply Co., Cincinnati
The I. J. Cooper Rubber Co., Cincinnati
The I. J. Cooper Rubber Co., Dayton
The I. J. Cooper Rubber Co., Toledo
The I. J. Cooper Rubber Co., Columbus
The I. J. Cooper Rubber Co., Cleveland
The I. J. Cooper Rubber Co., Indianapolis
The Pennsylvania Rubber & Sup. Co., Columbus
The Pennsylvania Rubber & Sup. Co., Cincinnati
The Pennsylvania Rubber & Sup. Co., Toledo
The Pennsylvania Rubber & Sup. Co., Akron
The Pennsylvania Rubber & Sup. Co., Youngstown
The Justus & Parker Co., Columbus
The Pennsylvania Rubber Supply Co., Cleveland

Oklahoma
Ratcliff-Sanders Grover Co., Tulsa
Severin Tire & Supply Co., Oklahoma City
Joplin Supply Co., Commerce & Tar River
Ratcliff Saunders, Vinita

Oregon
Archer & Wiggins Co., Portland
Chanslor & Lyon Co., Portland
Waterhouse & Lester, Portland

Pennsylvania
Berrodin Rubber Co., Philadelphia
Dyke Motor Supply Co., Pittsburgh
Front Market Motor Supply Co., Harrisburg
Gaul, Derr & Shearer Co., Philadelphia
General Motor Supply Co., Altoona
Johnstown Auto Co., Johnstown
Motor Accessories Co., Allentown
Pittsburgh Auto Equip. Co., Pittsburgh
Roberts, H. C. Elec. Supply Co., Philadelphia
The Pennsylvania Rubber & Supply Co., Erie
The Pennsylvania Rubber & Supply Co., Oil City

Rhode Island
Belcher & Loomis Hdwe. Co., Providence

South Carolina
Francke & Co., Inc., C. D., Charleston

South Dakota
L. & L. Motor Supply Co., Sioux Falls
Spaulding Supply Co., Aberdeen

Tennessee
Auto Supply Co., Nashville
Ozburn-Abston & Co., Memphis
Southern Auto Supply Co., Chattanooga
The I. J. Cooper Rubber Co., Knoxville
The I. J. Cooper Rubber Co., Memphis
The I. J. Cooper Rubber Co., Nashville

Texas
Electric Appliance Co., Dallas
Fisk Company of Texas, San Antonio
Fisk Company of Texas, Houston
Fisk Company of Texas, Dallas
Tri-State Accessories Corporation, El Paso

Utah
Intermountain Electric Co., Salt Lake City
Motor Mercantile Co., Salt Lake City

Virginia
Crump, Benj. T. Co., Richmond
Meadows-Price Co., Roanoke
Piedmont Hardware Co., Danville
Owens Merritt, Danville
Talman Auto Supply Co., Richmond

Washington
Chanslor & Lyon Co., Seattle
Holley-Mason Hardware Co., Spokane
Holter Hardware Co., Spokane
Reynolds & Reynolds, Tacoma

West Virginia
Hutchisson, T. T. Co., Wheeling
Williams Hardware Co., Clarksburg

Wisconsin
Andrae, Julius & Sons Co., Milwaukee
Shadbolt & Boyd Iron Co., Milwaukee
Western Motor Supply Co., Milwaukee

CANADA

Alberta
Chapin Co., Calgary
Motor Car Supply Co., Edmonton
Motor Car Supply Co., Calgary
Wood Valance & Adams, Calgary

British Columbia
Wood, Valance & Leggat, Ltd., Vancouver

Manitoba
Wood, Valance & Leggat, Ltd., Winnipeg.

Ontario
Bowman Anthony Co., Windsor
Hyslop Bros., Toronto
Wood, Alexander & James, Hamilton

Saskatchewan
Bowman Bros., Ltd., Saskatoon
Bowman Bros., Ltd., Regina

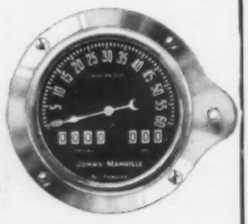


Johns-Manville Non-Burn Asbestos Brake Lining

Non-Burn is the only Asbestos Brake Lining that is absolutely independent of the open asbestos market. We obtain the asbestos from our own mines, separate and grade it in our own mills and spin and weave it into Non-Burn in our own factories.

You are positively assured of an ample, steady supply and prompt deliveries.

Johns-Manville Speedometer for the new Fords



With these speedometers in stock you can profitably meet the demands of the man who wants a good speedometer for his new starter and light equipped Ford.

The instrument is simple, sturdy and easily attached. It fits exactly.

Also models for Fords not equipped with starters.

Johns-Manville Hub Odometer

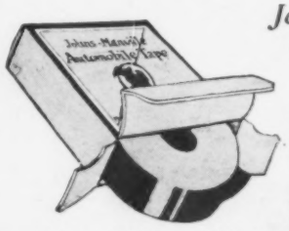


The dealer who carries the Johns-Manville Hub Odometer is able to handle the increasing requests of owners of business cars and trucks for an accurate but inexpensive instrument that will keep accurate track of car mileage.



Johns-Manville "Noark" Automobile Lighting Fuses

You can back these fuses as absolute safeguards for your customers' batteries. The name "Noark" means split-second accuracy—inherent, because of experienced, scientific construction.

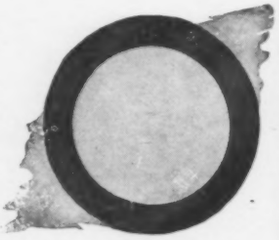


Johns-Manville Automobile Tape

For many years, Johns-Manville Tapes have enjoyed a reputation for strength and dependability which is second to none.

Dealers who handle this material have learned that they can rely on it to give satisfaction. Johns-Manville Tape is guaranteed.

Johns-Manville Clutch Facing



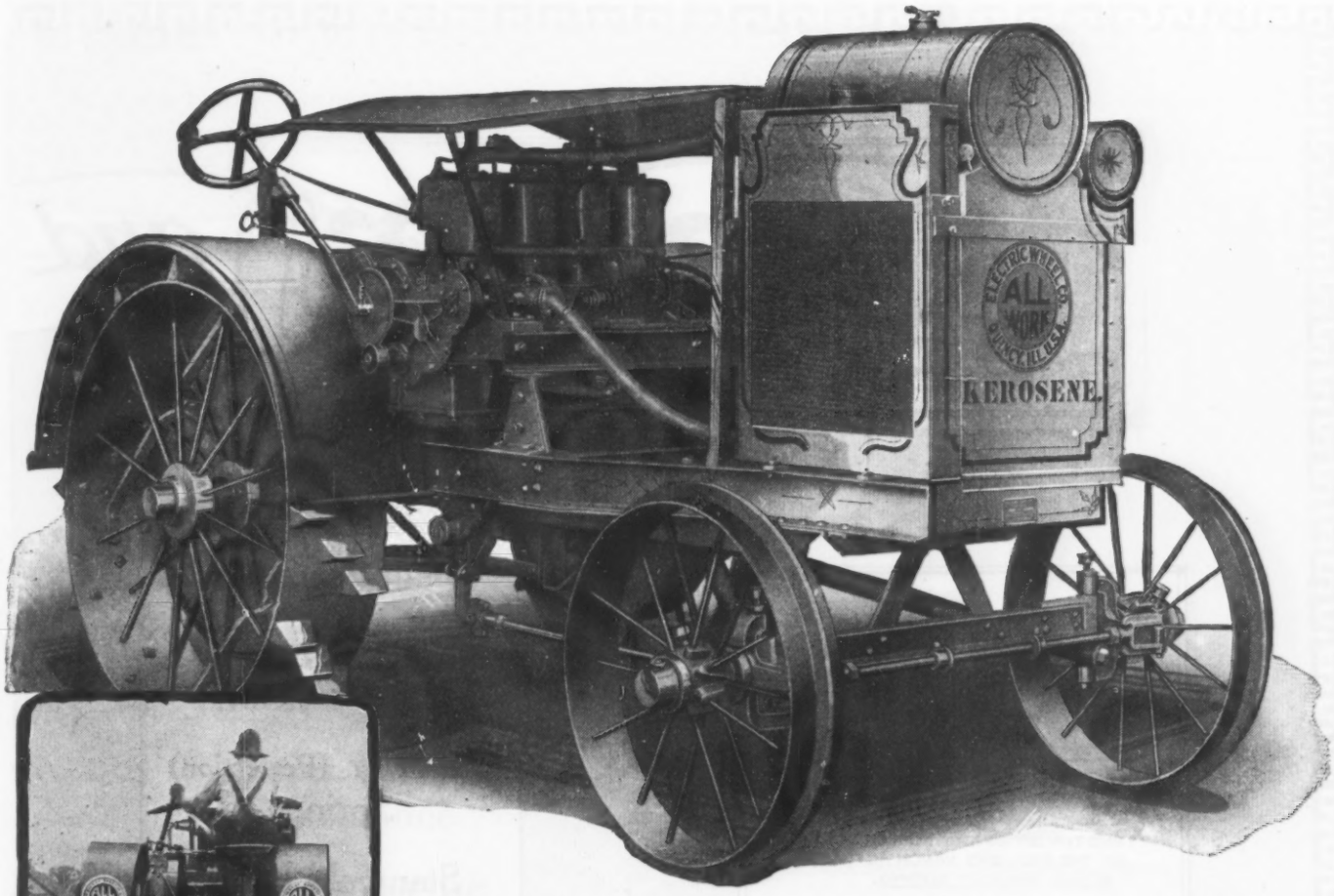
When you install clutch facings, you can reinforce your own skill with the quality, wear-resistance and gripping power that are built into Johns-Manville Clutch Facing.

Johns-Manville Automotive Mogul Packing



For water pumps and similar places, where a small twisted or braided packing is required, Mogul Packing makes a tight job. Besides stopping the leaks, it is a natural lubricant. Keep Mogul Packing on hand, there are lots of uses for it.

Also Johns-Manville Seigelite and Service Automotive Sheet Packings.





Wonderful Performance

"We plowed from 9 to 10 acres per day with our ALLWORK, burning only 20 gallons of kerosene. The best plowing engine we ever saw. After plowing 150 acres, harrowing, grinding, running ensilage cutter, etc., we inspected the gears and crank bearings and the wear could not be noticed at all."

HERZOG BROTHERS,
Atchison, Kan.

More Farmers Are Demanding The ALLWORK Surplus Power

When you represent the ALLWORK Kerosene Tractor you will be able to offer a tractor that has more power for its weight than any other four-wheel tractor. It is in a class by itself as a SURPLUS-POWER TRACTOR

The ALLWORK will pull three plows easily in hard, wet, sticky ground. Will handle a 10-foot double disc harrow and a two-section harrow without the least difficulty.

It performs all kinds of field and belt work the year 'round—spring, summer, autumn and winter.

Possesses a powerful motor—the type usually employed to pull *four* plows—a four-cylinder engine with five-inch bore and six-inch stroke. *Absolutely guaranteed to burn kerosene successfully.* Transmission system is direct spur gear drive. No bevel gears. This positively assures *10 to 15 per cent more power at the drawbar.*

WRITE US FOR DEALERS' TERMS—THEY WILL INTEREST YOU

ELECTRIC WHEEL CO., Box 301A, Quincy, Illinois

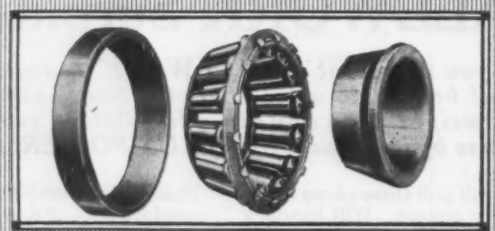
Allwork
KEROSENE TRACTOR

"Backed by 12 Years of Tractor Experience"

Stan-Par and PRODUCTS



END THRUST OF THE ROLLER IS TAKEN BY THE BALL END WHICH ACTUALLY ROLLS WITHOUT SLIDING.



Stan-Par Axles

Bock Taper Roller Bearings

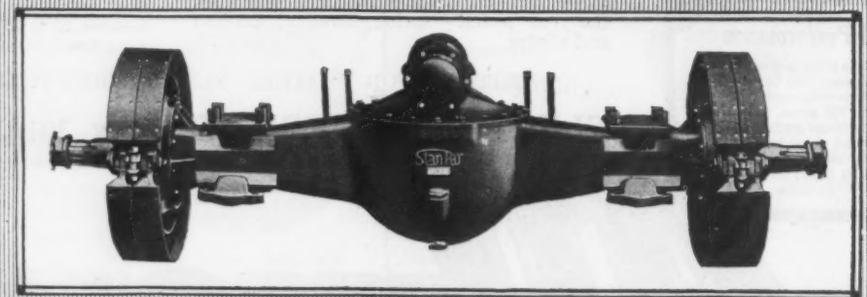
Stan-Par (Perfection) Springs

Stanweld Rims

Stanweld Tubing and Tubular Parts

Brake Rods and Rod Assemblies

Forgings



THE STANDARD PARTS COMPANY

Executive Offices, Cleveland

the Stan-Par IDEA

Sound Engineering

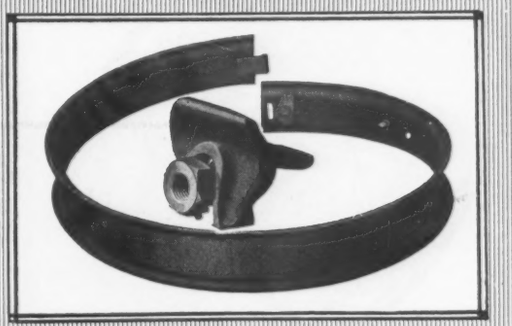
Correct Manufacturing

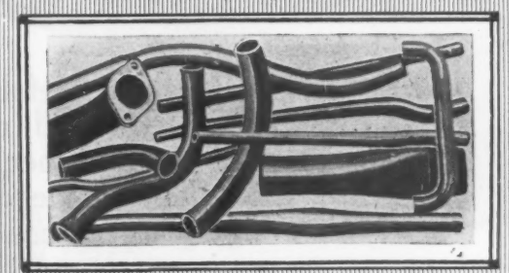
Dependable Performance

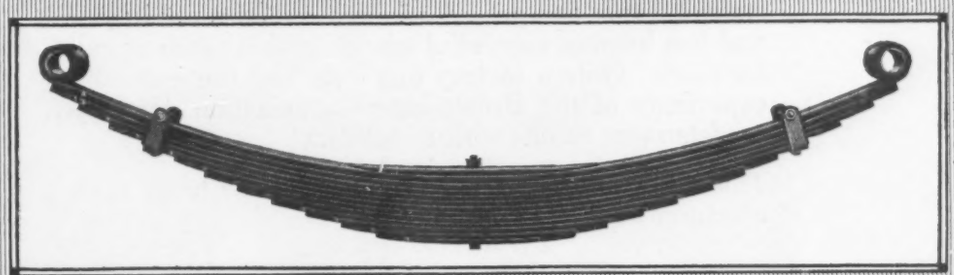
Intelligent Service

Pleasant Business Relations—

With All Proper Respect for and a Welcome to Competition





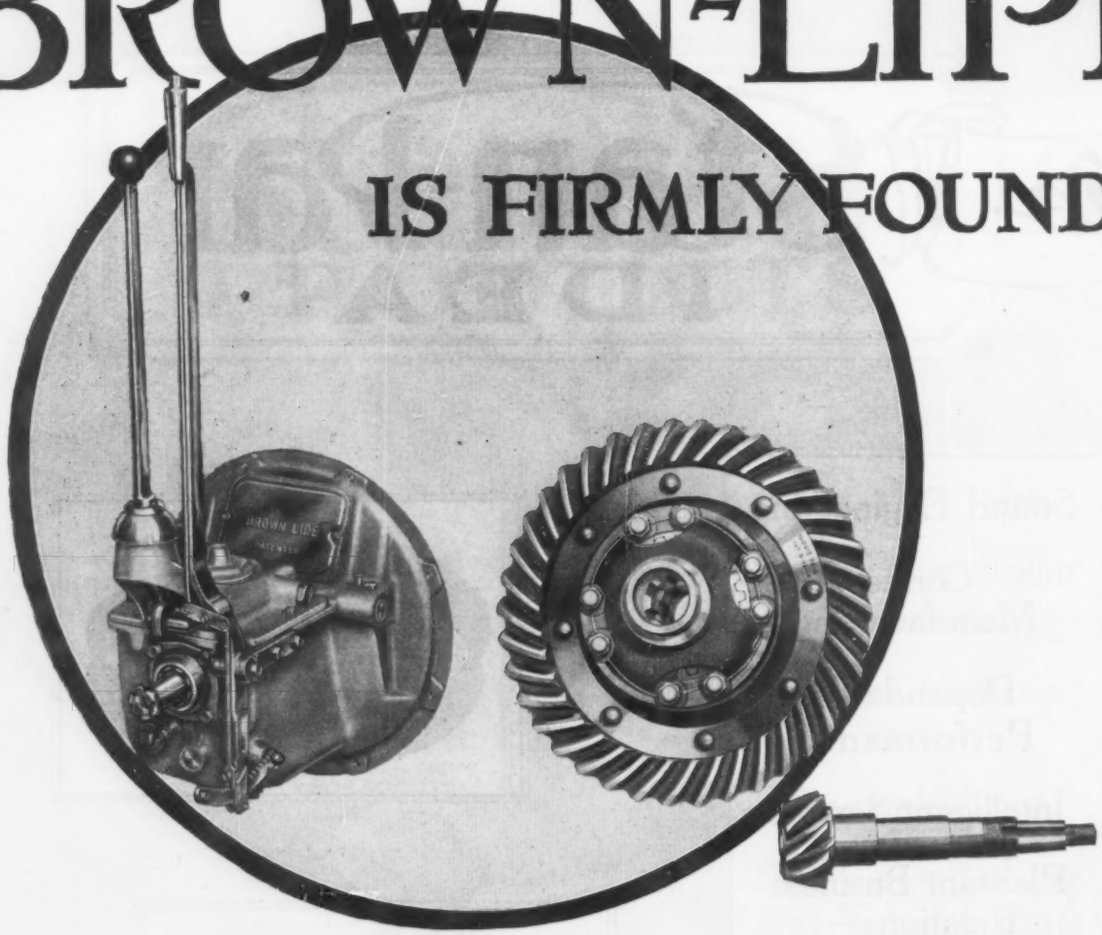


THE STANDARD PARTS COMPANY

Factories: Cleveland, Toledo, Canton, Cincinnati, Flint, Mich., Pontiac, Mich., Wheeling, W. Va., Connersville, Ind.

BROWN-LIPE

IS FIRMLY FOUNDED



AFTER carefully analyzing a customer's needs and designing a transmission or differential to meet every requirement of load, installation, axle construction, type of clutch, engine to be used, speeds, etc., Brown-Lipe Engineers have this additional advantage.

They check their theoretical design with a similar installation that has passed through quantity production and has been in successful service in thousands of cars for years. Only a factory that has had the extensive experience of the Brown-Lipe Organization can thus *predetermine* results with *certainty*.

This has a world of meaning to the car or truck manufacturer as well as owner.

BROWN-LIPE GEAR TRANSMISSIONS

BROWN-LIPE GEAR CO.

TRANSMISSIONS

SYRACUSE, N. Y.

ENGINEERING

ON EXPERIENCE

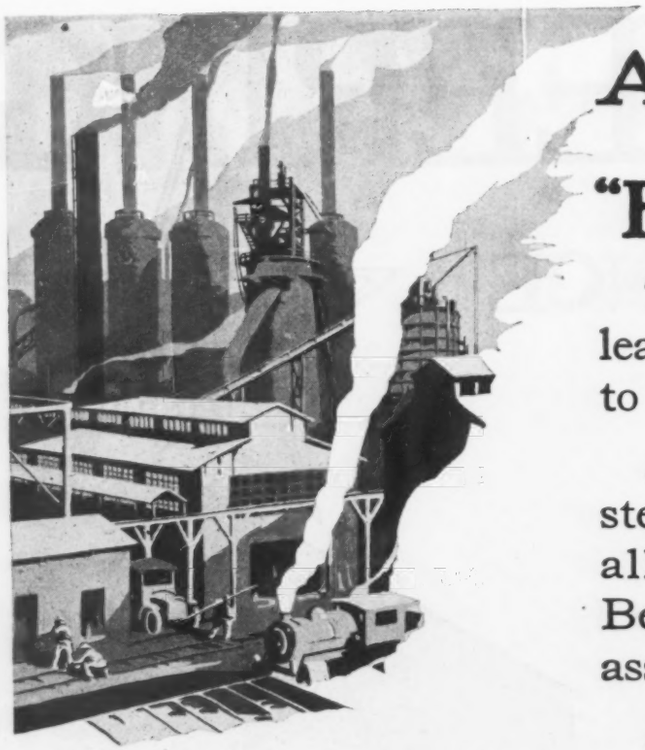
BROWN-LIPE
CHAPIN
DIFFERENTIALS



BROWN-LIPE CHAPIN CO.

DIFFERENTIALS

SYRACUSE, N. Y.



Across the Street *from* "Bethlehem Steel"

The experience of the world's leading steelmakers is available to Bethlehem engineers.

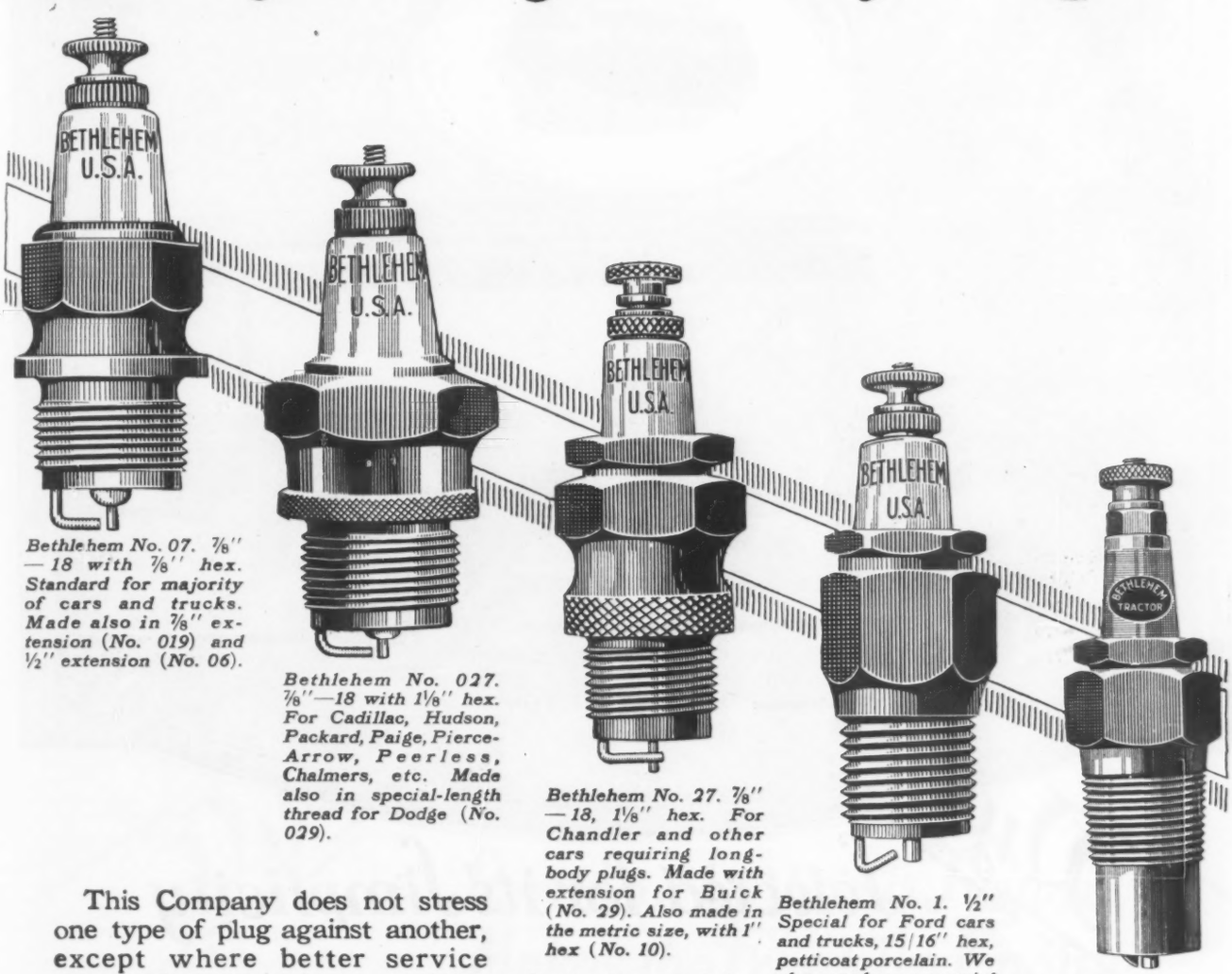
An uninterrupted supply of steel for the shells and special alloys for the electrodes of Bethlehem Spark Plugs is assured.

A proved product, backed by ample capitalization, efficient management and national advertising, bespeaks the *permanence* of Bethlehem Spark Plugs.

This stability of Bethlehem is an asset to motor-car manufacturers, accessory dealers and motorists alike. 25,000 Bethlehem Spark Plugs a day, an ultra-modern factory and a close-welded service organization assures steady deliveries.

Bethlehem

The Right Plug for Every Purpose



Bethlehem No. 07. 7/8" — 18 with 7/8" hex. Standard for majority of cars and trucks. Made also in 7/8" extension (No. 019) and 1/2" extension (No. 06).

Bethlehem No. 027. 7/8"—18 with 1 1/8" hex. For Cadillac, Hudson, Packard, Paige, Pierce-Arrow, Peerless, Chalmers, etc. Made also in special-length thread for Dodge (No. 029).

Bethlehem No. 27. 7/8" — 18, 1 1/8" hex. For Chandler and other cars requiring long-body plugs. Made with extension for Buick (No. 29). Also made in the metric size, with 1" hex (No. 10).

Bethlehem No. 1. 1/2" Special for Ford cars and trucks, 15/16" hex, petticoat porcelain. We also make a special Fordson Tractor Plug (No. 12).

Bethlehem No. 92. 3/4" long de Luxe Mica Tractor Plug, standard equipment International Harvester Co., also some types Hart-Parr and Case Tractors. Also made in 3/4" size (No. 91), 7/8"—18 (No. 94), also 7/8" long (No. 95). Also mica plugs for cars, trucks and motorcycles.

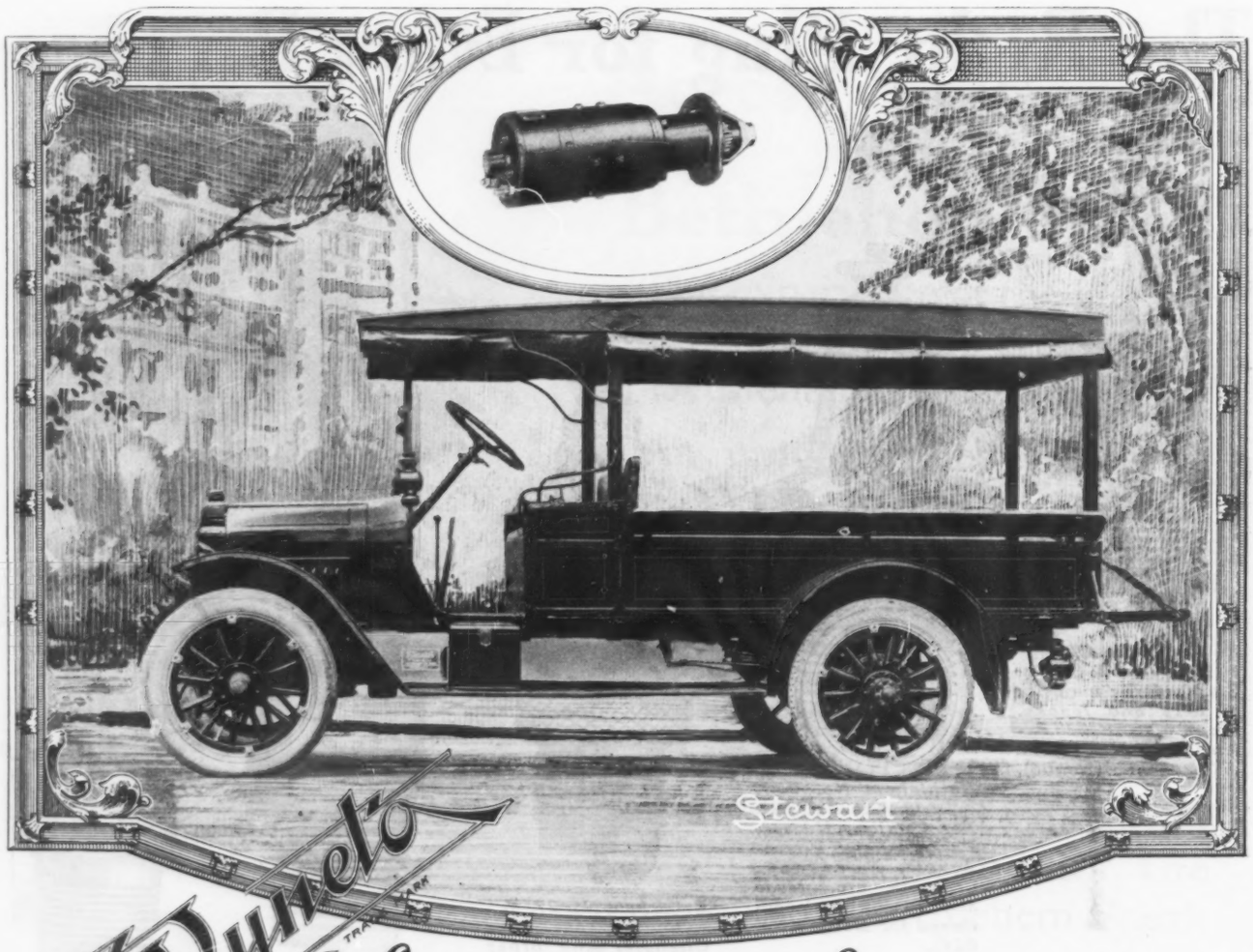
This Company does not stress one type of plug against another, except where better service *demands* a particular type. We make both porcelain AND mica plugs and can, without bias, sell you just the plug best suited to your requirements. The Bethlehem de Luxe Tractor Plug is differently made. We cut our own imported mica, wind it laterally about the center spindle—then build up over this with mica washers, compressed into a granite-like whole.

BETHLEHEM SPARK PLUG CORPORATION

E. H. SCHWAB, President

Bethlehem, Pa.

SPARK PLUGS



Dyneto
REGISTERED

Selected for its Simplicity

Dyneto Starting System was chosen for use on Stewart Trucks because of its thorough reliability and extreme freedom from complications.

The Dyneto Starting Motor is a very compact, dust proof instrument mounted on the fly wheel housing.

The wiring required is exceedingly simple and practically fool proof.

Nowhere are simplicity and thorough dependability more appreciated than in a motor truck installation.

Twenty passenger cars and trucks use the Dyneto as standard equipment.

Manufacturers: Send drawings and specifications for our recommendation

DYNETO ELECTRIC CORPORATION
Syracuse, N. Y.

EXPORT REPRESENTATIVES: BENJAMIN WHITTAKER, INC., 21 STATE ST., NEW YORK, N. Y.; 56 LUDGATE HILL, LONDON, E. C. 4



Dyneto
REGISTERED

Starting & Lighting System Makes the Franklin Engine Non-Stallable

The Dyneto has been used on The Franklin Since 1913

The fear of a stalled engine in traffic jams or railroad crossings is banished forever from the mind of the Franklin Driver. Should the clutch be too suddenly applied or the engine's power fail for any other reason, the Dyneto Starter instantly takes hold with strength sufficient to move the car or start the engine again.

To one accustomed to starting and lighting systems, the extreme simplicity of the Dyneto makes an instant appeal.

Twenty passenger cars and trucks use the Dyneto single or two unit as standard equipment.

Send drawings and specifications for our recommendation

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Willard SERVICE STATION
1809-10 MAIN STREET

Fowler's Battery Service
DISTRIBUTORS
Willard Storage Batteries
Storage Battery Service Station Equipment
COLUMBIA, S. C.

October 18, 1919.

Perry-Mann Electric Co.,

Columbia, S. C.

Attention: Mr. M. L. Mann.

Gentlemen:-

Referring to your recent letters which inquire into our experience with Tungar Rectifiers we are glad to explain below the satisfaction we have had in the use of these machines.

About three years ago we installed our first machine in our service station at Thomasville, Ga. and it was so satisfactory that we have used nothing else since that time and at present our company is using between 40 & 50 rectifiers at different service stations. The photographs of this place only shows 10 machines but since the time the photographs were made we have installed four additional machines, making 14 in operation here. In addition to the machines we are using we have sold approximately 100 rectifiers to our Associated service stations.

With all these machines we have only had one that it was necessary to return to the factory and we consider this a remarkable record.

Yours very truly.

FOWLER'S BATTERY SERVICE, INC.,

Pres.

WJF/MLS

Willard

Tungar
BATTERY CHARGER

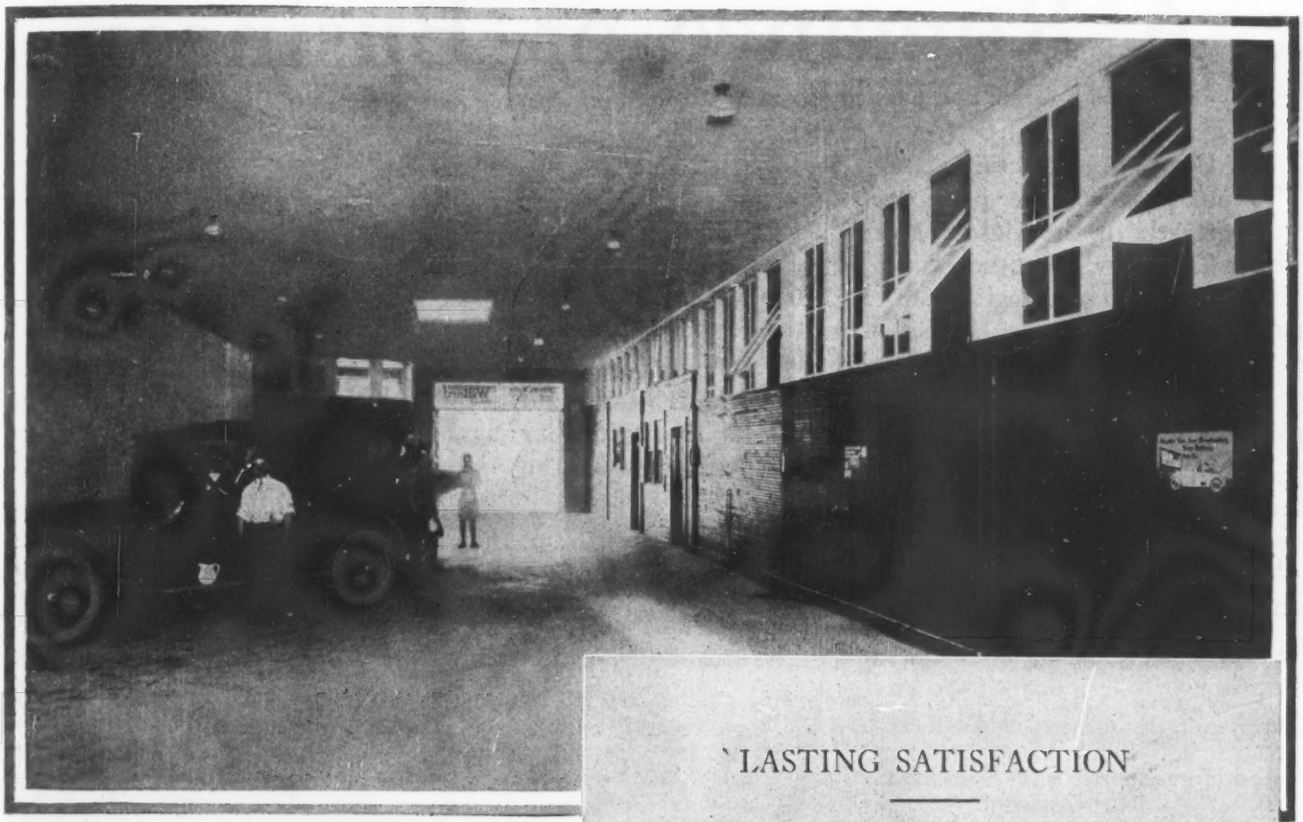
At the left is reproduced a letter received by a Tungar distributor. This is but one of many such, which go to show the excellent satisfaction given by this type of battery charger.

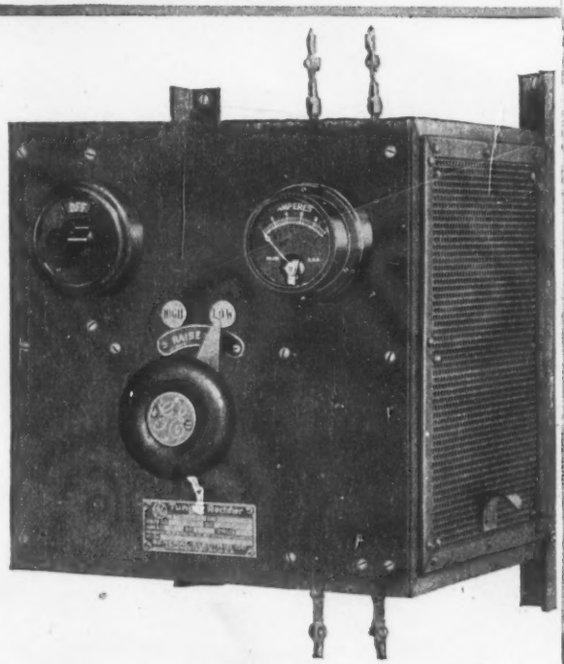
General Electric Company

General Office
Schenectady, N.Y.

Sales Offices in all large cities

35-A-39





LASTING SATISFACTION

Because of their simplicity and efficiency, Tungar battery chargers have won almost instant popularity. Because of their reliability they have kept the friends they have made and orders of additional sets by pleased users have kept our factories busy. Thirteen thousand Tungars are in service today in garages and battery service stations.

Look for the G-E space at the Automobile Shows in New York and Chicago. Tungars will be on exhibition and also PYROTIP, the new G-E lead burner, which cuts down trouble and expense in storage battery repair work.

General Electric Company

General Office
Schenectady, N.Y.

Sales Offices in all large cities

35-A-39

A Romance of Business

Truth is stranger than fiction because truth does not have to be probable.

HAD a writer of fiction written a story about the phenomenal growth of the Mason Tire & Rubber Company, he would have been complimented on his imagination. But that story is written in solid fact—in brick and steel—and in the more solid good will of American motorists.

Three years ago the Mason Company began with the small but well-equipped plant shown in the circle. Today the Mason factory ranks among the "big six" of the Akron district, with equipment second to none.

The secret of Mason success lies in the belief that—

> No material is too expensive, no workmanship too skilful, no detail too unimportant, when it is a question of producing a tire that shall give *service*.

A little more than three years ago the first Mason Fabric Tire was built. The first Mason Heavy Duty Cord is less than two years old. Their nation-wide use today speaks more eloquently of the service rendered American motorists than anything we could say.

So sure is Mason quality that every Mason Tire carries its guarantee from defects of material or workmanship for the life of the tire. There is no mileage limit; rather, the guarantee is of satisfactory service; and we pin our faith to the mileage that is built into every tire, whether it be Heavy Duty Cord, Maximile Fabric or Heavy Duty Solid.

> Car owners who seek sturdy, dependable, big mileage tires, have come to recognize the name Mason as standing for the finest quality tire that can be produced.

EVERY safeguard has been taken to maintain unvarying quality in Mason Tires. Each step in the making of a Mason Tire takes place in the Mason plants. Even the tire fabric will be made from raw cotton in the mills of the Mason Cotton Fabrics Co., adjoining the tire plant.

The Mason Tire & Rubber Co.

Kent, Ohio

Direct factory branches in:

Boston	Oklahoma City	San Francisco
Jacksonville	Chicago	Denver
Cincinnati	Detroit	Kansas City
Milwaukee	Des Moines	Dallas
New York	Indianapolis	
Wheeling		
Atlanta		
Cleveland		

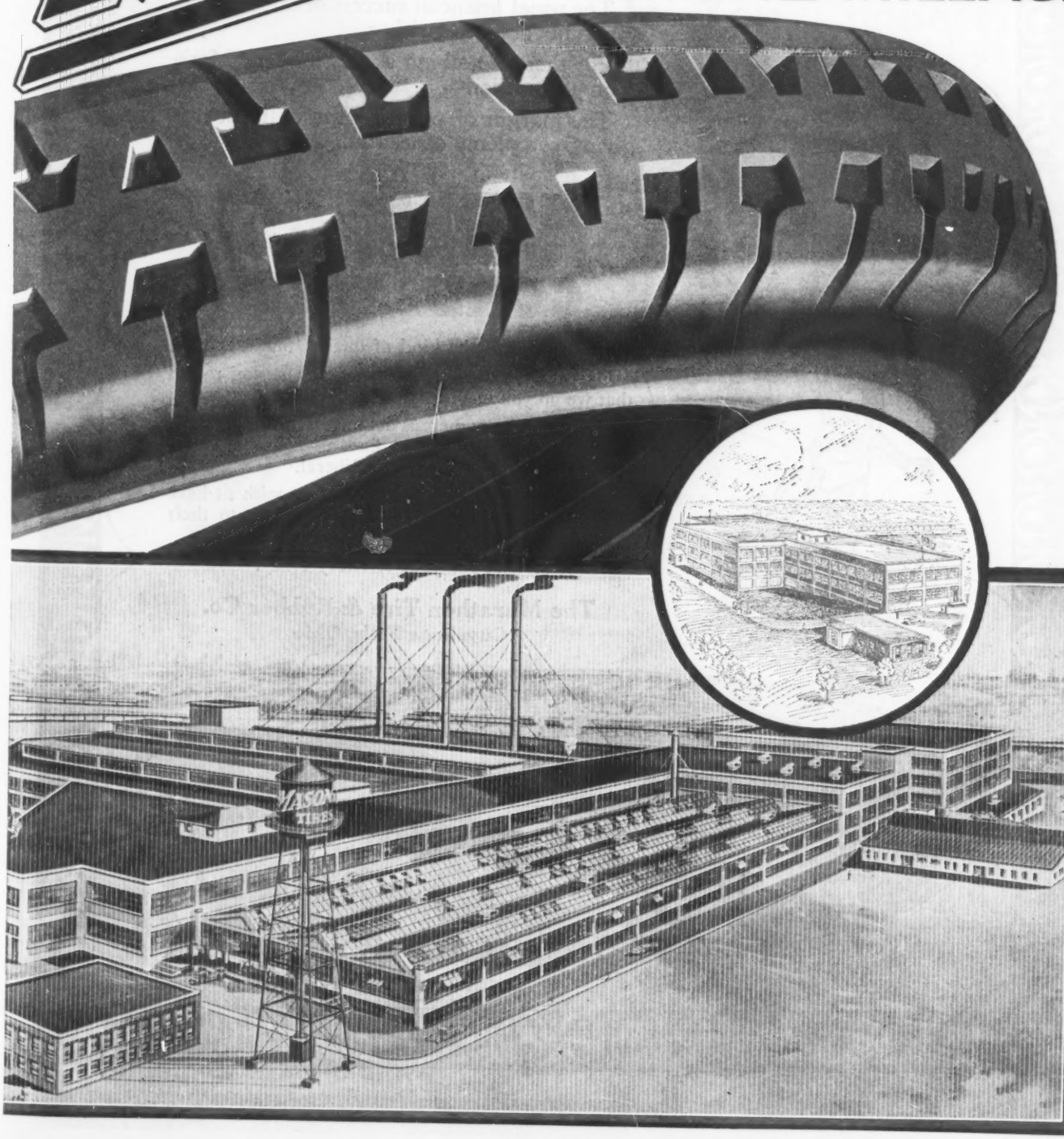
TO DEALERS:

The 1920 Mason National Advertising Campaign begins with a double page in *The Saturday Evening Post* of January 3rd. Let us send you the dealer plan.



MASON

MEANS MORE MILEAGE



The liberality of the ..... Marathon proposition has proven highly profitable to our distributors.....

The usual financial success of our distributors is not at all surprising.

For there is nothing skimped in the Marathon proposition—

The margin of profit is unusually liberal, giving you plenty of leeway.

MARATHON CORD TIRES

—are brimful of the kind of quality that satisfies—

Our co-operation in sales and advertising means that we go you one better for every effort you make.

And with the numerous dealings which a distributor has with the factory he finds us—not close, contrary or narrow-minded—but liberal.

Distributors who have cast their lot with us have never regretted it—they point with pride to their achievements with this line.

Write or wire for your territory today.

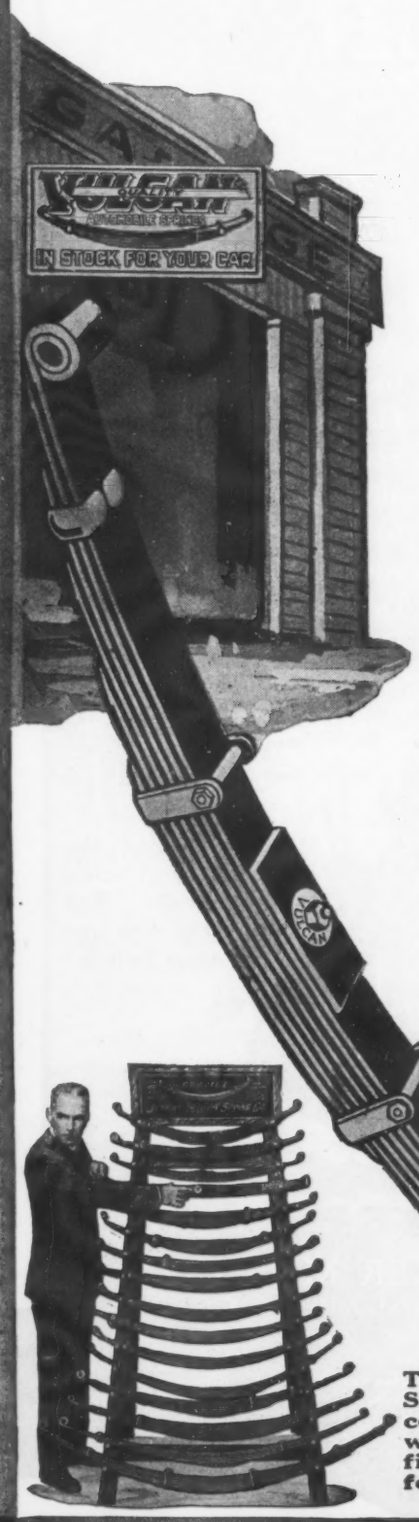
The Marathon Tire & Rubber Co.
Cuyahoga Falls, Ohio



When Springs Break

put on

VULCAN QUALITY
The Replacement Spring



How Do You Connect *Service* and *Profit?*

Over 8000 dealers throughout the United States know that

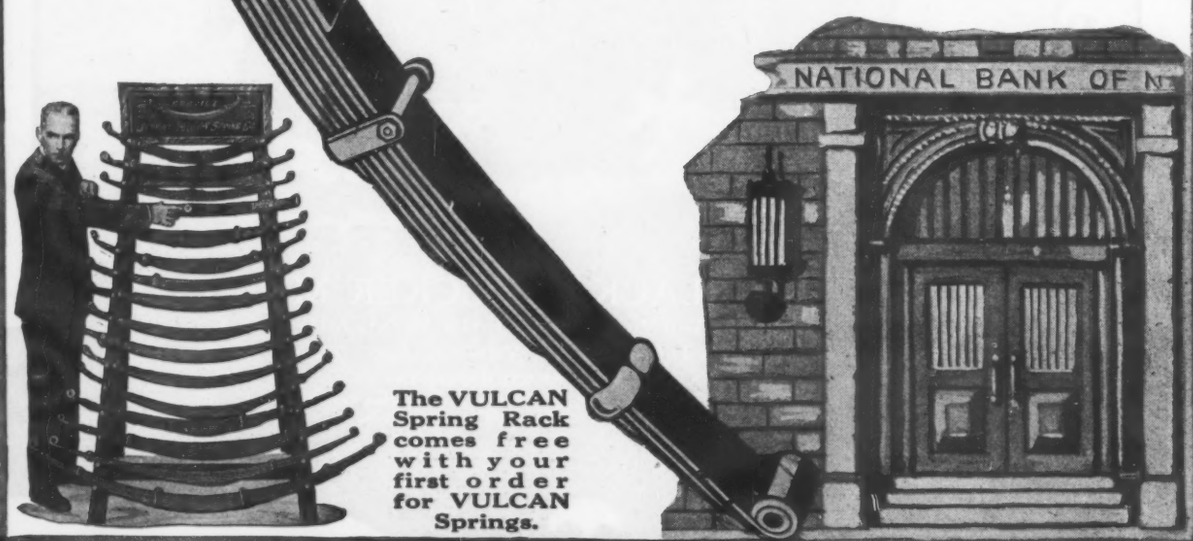
VULCAN SPRINGS

bind service and profit together.

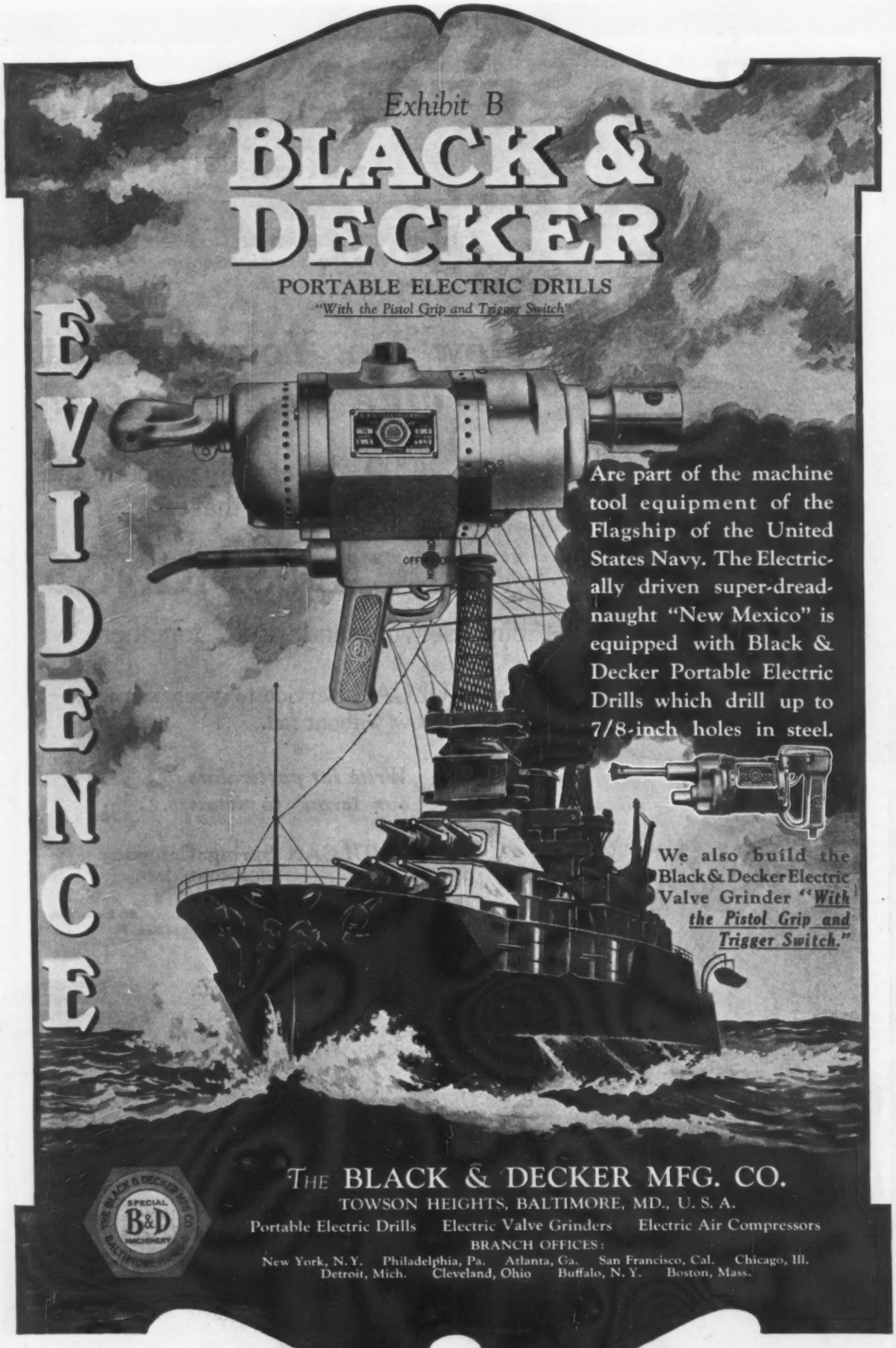
Give VULCAN Service to your territory—profits follow without fail.

Write for particulars of our terms to dealers.

Jenkins VULCAN Spring Company
Factory, RICHMOND, IND.
Branches
Atlanta, Ga. Dallas, Tex. Minneapolis, Minn. St. Louis, Mo.
Boston, Mass. Kansas City, Mo. Reading, Pa.



The VULCAN Spring Rack comes free with your first order for VULCAN Springs.


Exhibit B
BLACK & DECKER
PORTABLE ELECTRIC DRILLS
"With the Pistol Grip and Trigger Switch"
EVIDENCE
Are part of the machine tool equipment of the Flagship of the United States Navy. The Electrically driven super-dreadnaught "New Mexico" is equipped with Black & Decker Portable Electric Drills which drill up to 7/8-inch holes in steel.
We also build the Black & Decker Electric Valve Grinder "With the Pistol Grip and Trigger Switch."
THE BLACK & DECKER MFG. CO.
TOWSON HEIGHTS, BALTIMORE, MD., U. S. A.
Portable Electric Drills Electric Valve Grinders Electric Air Compressors
BRANCH OFFICES:
New York, N.Y. Philadelphia, Pa. Atlanta, Ga. San Francisco, Cal. Chicago, Ill.
Detroit, Mich. Cleveland, Ohio Buffalo, N. Y. Boston, Mass.

Marketed on a selling basis that capitalizes your ability

How dissatisfaction of most tire dealers and jobbers is being overcome



MALL discounts —no protection in your territory —low repeat sales — no exclusive selling points.

These tire trade evils are the source of tire dealer's and jobber's dissatisfaction with tire profits all over the United States.

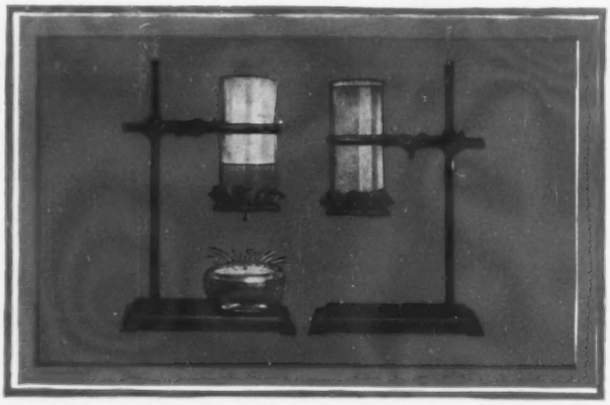
They arise because most manufacturers insist that the tire dealer and jobber is *not a salesman but merely supplies the demand.*

Yet almost every dealer and jobber knows that given a quality tire, exclusive territory, sales and advertising co-operation, he could double and triple his tire business. He could build up a new scale of profits and capitalize his own sales ability.

Overcoming tire trade evils

To help dealers and jobbers to greater profits and repeat sales, to give free play to their sales ability and to reward them properly for their sales effort, the manufacturers of Thermoid tires, made of non-porous Crolide Compound, have adopted and successfully put through a *real selling proposition.*

Thermoid Tires were announced last year on a selling basis with exclusive territories and *real sales discounts.* The response of the trade was enormous. Hundreds of dealers wired in for the proposition. Contracts in every state in the Union were made with jobbers and dealers. Thermoid tires became a success. The factory



ORDINARY "POROUS" RUBBER

A tumbler full of water oozes through a thin sheet of "porous" rubber in time.

NON-POROUS COMPOUND RUBBER

Because the small pores are sealed up by the compound, this thin sheet is watertight.

was oversold four weeks after the first announcement.

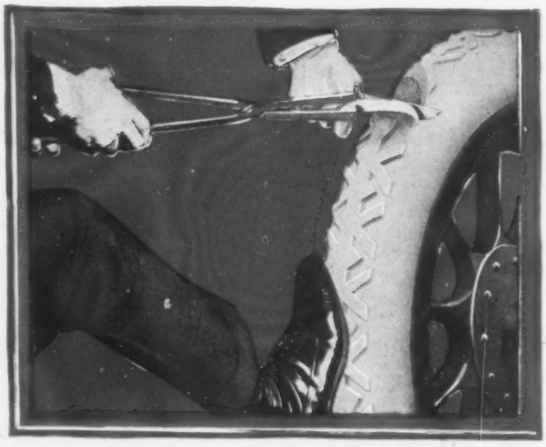
Meeting the consumer demand

The Thermoid tire factory has been enlarged to meet the unexpectedly large demand. The same program which capitalizes the dealer's ability is continued for 1920. Success is following the introduction of Thermoid tires to the consumer in every territory. Tire users know why Thermoid tires far outwear their bond guarantee. *They have been "sold" by the dealers.*

Non-porous Crolide Compound makes Thermoid distinctive

Dealers have explained to their customers how ordinary "porous" rubber loses its original strength and elasticity in hard service. The wear of the road, heat and friction, the strains produced in turning corners, sudden stopping and starting cause rapid deterioration in "porous" rubber.

"Porous" rubber tires soon begin to chip and cut easily, sand boils follow, the tread is easily loosened and blow-outs follow inevitably.



You can't pull the tread off a Thermoid Tire



So elastic is Crolide Compound Rubber that a one-inch strip stretches to 7⅞ inches.

In March, 1917, a chemical formula was produced which greatly reduces the porosity of rubber. The new compound increased toughness 50% to 200% over ordinary grades of rubber. The elasticity was so increased that a one-inch strip stretches to 7⅞ inches. The "porosity" test with plain water in a glass shows the great difference. This Compound was named "Crolide."

Ten thousand tires were produced and tested during 1917 and 1918 under every possible condition. The results were surprising even to the manufacturer. An adjustment basis of 6000 miles (7500 for Ford sizes) was immediately adopted.

This is the story which Thermoid local advertising is carrying in the newspapers at every central Thermoid sales point. Large space in local newspapers which circulate in the jobber's territory, together with posting, creates consumer demand which helps every dealer and gives the opening wedge for his own sales talk. Such Thermoid local newspaper advertising is supplied free.

In addition to the central newspaper advertising done by the Thermoid Rubber Company, free newspaper electros are furnished to all dealers who desire to use them in their local newspapers.

These enable the dealer in any part of the jobber's territory to use a little space at low cost in his own paper.





Write today for the Thermoid sales proposition

THE Thermoid Sales Plan explains fully what the three great advantages of Thermoid tires mean to every dealer.

1. Thermoid tires are distinctive from all others, because they are made non-porous with Crolide compound.

2. Selling discounts which pay greater profits.

3. Exclusive territory with advertising and sales co-operation by the Thermoid Rubber Company.

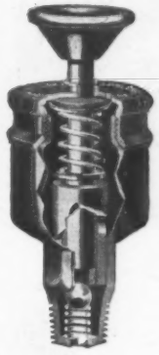
A postal card may open up a great new business field to you. Mail your request for complete information at once.

THERMOID RUBBER COMPANY

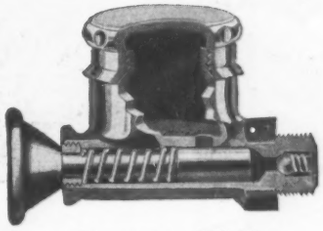
Factory and Main Offices: Trenton, N. J.

New York Chicago San Francisco Detroit
Atlanta Cleveland Philadelphia
Pittsburgh Boston London Paris Turin

Fitting all cars with Kipp-adapters



Cut-away view of Model "H" Oil-Kipp for Steering Knuckles and other vertical positions.



Cut-away view of Model "K" Oil-Kipp for Spring Pins and other horizontal positions. Kipp-Adapters fit Oil-Kipps to any make of truck or car.

Much of the immediate success of Oil-Kipps in replacing ordinary methods of chassis lubrication is due to the remarkably simple and complete series of Kipp-adapters.

Because of these adapters, Oil-Kipps can be quickly applied on any model of car or truck, to silence squeaks and make steering easy.

Oil-Kipps are small magazine force-pumps that one filling from the oil-can loads with about twenty shots of heavy oil.

By simply snapping their spring plungers, you can lubricate your chassis in three minutes—without dirt or bother.

Where grease cakes and gums—where ordinary oil cups fail because the drill holes of the bolts get clogged by dirt—Oil-Kipps unfailingly shoot their oil through the smallest drill holes and over the snuggest bearing.

By applying them to the spring bolts, you stop the squeaks that gnaw away at spring bolts and cause rattles and bumpy riding.

By using them on the steering knuckles, you make steering easy.

The Kipp-adapters make the application of Oil-Kipps a very simple matter.

They also make it easy for garages and dealers to carry an adequate stock.

A moderate supply of Oil-Kipps and full sets of the inexpensive adapters will take care of every kind of car.

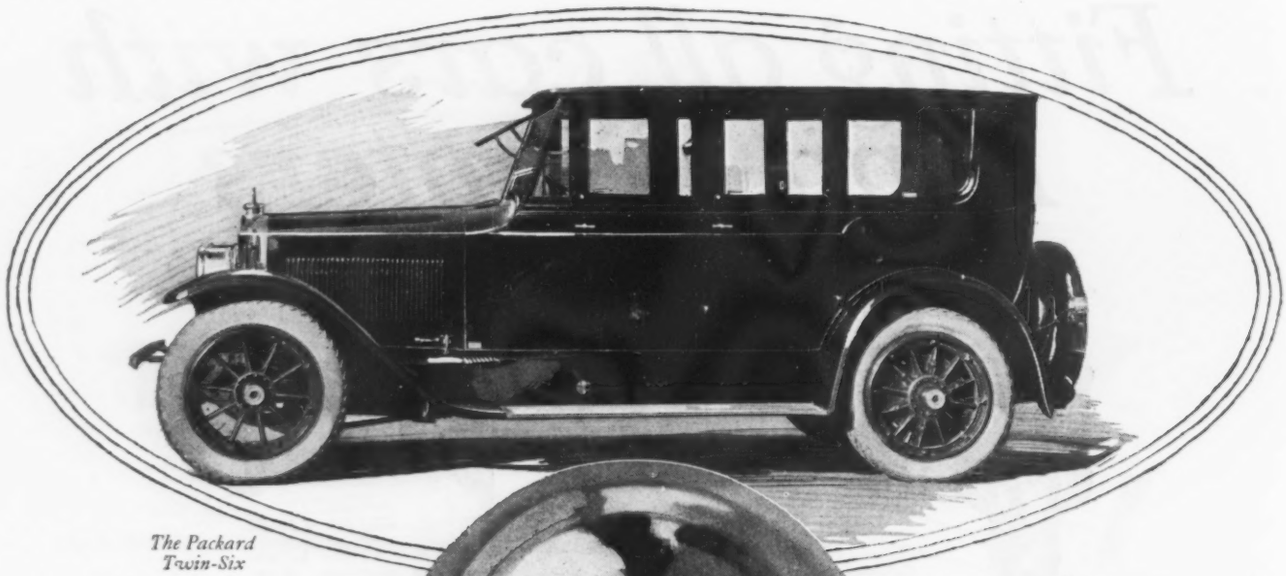
Write for our catalog of adapters and for our Oil-Kipp proposition to dealers.

MADISON-KIPP CORPORATION
Madison, Wisconsin

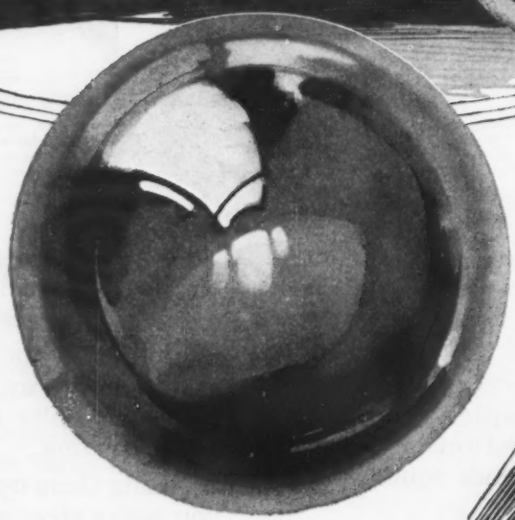
Madison Kipp

Oil-Kipps

KEEP CARS NEW



The Packard Twin-Six







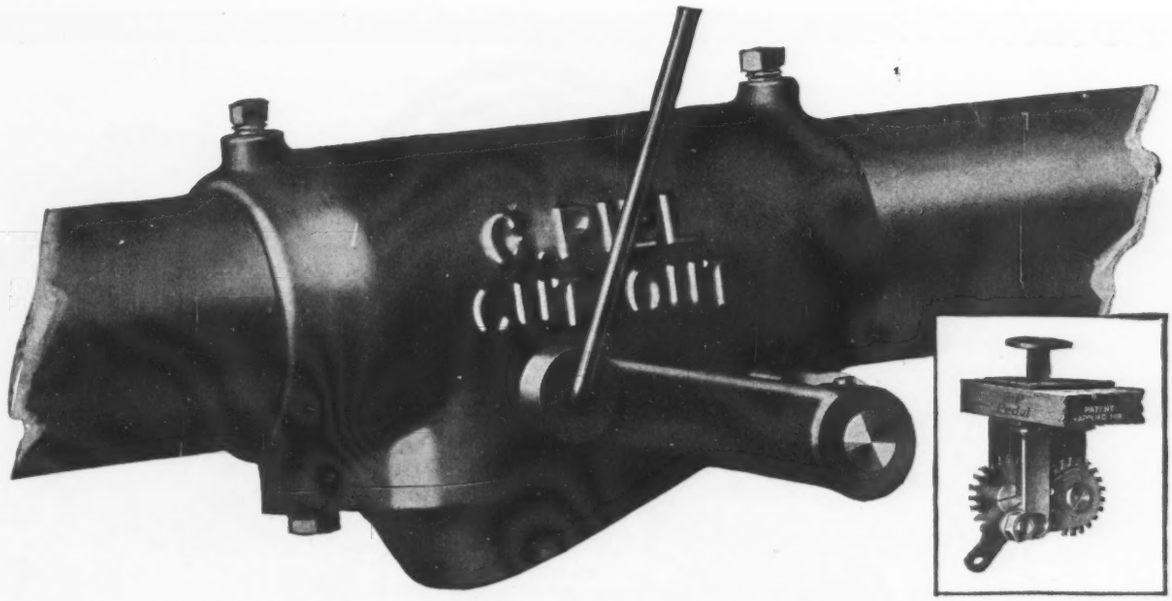
THE riding comfort of a deeply cushioned pullman, in motor cars, is obtained from ball bearings working on toy-like steel balls, which soothe the disturbing elements.

Perfectly round and velvety smooth steel balls evolved from intensive research and manufacturing experience, is the Hoover Steel Ball's contribution to your riding comfort.

HOOVER STEEL BALL CO.
Ann Arbor Michigan

HOOVER

HOOVER
STEEL BALLS



Sales of this cut-out larger than ever

1920 national advertising a tremendous success!
Progressive dealers averaging one to five sales a day!

THIS is the biggest year in the history of muffler cut-outs. The advertisements now running are putting G-Piel Cut-Outs on thousands of passenger cars and trucks, new and old.

The G-Piel success is built upon advertising, trade and NATIONAL. The G-Piel is the only nationally advertised cut-out.

Even when G-Piel advertising was confined to a few trade papers sales increased 25% and 37% from one year to the next. During 1919, the first year of G-Piel NATIONAL advertising, sales showed the unprecedented increase of 317% over 1918.

Here are the figures:

1917 sales increased	25%
1918 sales increased	37%
1919 sales increased	317%

This 317% increase has made necessary the erection of one of the largest and best equipped factories of its kind in America.



Four times as much advertising this year

The more advertising, the greater the demand for G-Piel Cut-Outs. And this year—1920—twenty-one big advertisements are appearing in the two greatest weekly magazines in the country—the Saturday Evening Post and the Literary Digest. This campaign will run right through the year—from January to December.

The circulation of these magazines is so tremendous that 6,000,000 motorists and their friends can be reached with a single G-Piel Cut-Out advertisement, and there are twenty-one separate insertions.

Estimate your 1920 requirements now

Go over your lists of customers and prospects and make an estimate of the number of G-Piel Cut-Outs that can be sold. Place your stock order with your jobber NOW. This is the one way to guard against disappointment.

Many dealers report a steady sale of one, two, three, four and five cut-outs a day.

How to tie up with this advertising

We supply a display hanger showing the different consumer advertisements. Display this prominently in your show-window, as it identifies you with the national campaign and brings up the subject of cut-outs just at the psychological moment.



Also display the G-Piel chart. It shows just what size cut-out any car needs. Following this chart guarantees satisfaction to the car-owner—and he boosts G-Piel Cut-Outs to his friends.

Don't delay—get in touch with your jobber NOW.

Sales Department
EDWARD A. CASSIDY CO.
280 Madison Ave. New York
THE G-PIEL COMPANY

G-Piel Muffler Cut-Out

tells the motor's secrets



Duratex Automobile Upholstery a Genuine Quality Product That Adds to the Beauty and Value of Any Automobile

RICH finish, beautiful colors, soft, pliable texture and a wonderful degree of wearability—these are the qualities that stamp Duratex as the Better Automobile Upholstery.

Duratex is weatherproof in every way—snow, water, sun—nothing can injure its pliability or fade its colors or in any way mar its beautiful finish.

Duratex should never be confused with the ordinary upholstery materials nor with the welter of "imitations" or "substitutes".

Duratex is a genuine quality upholstery—the perfected product of an institution that specialized in the very finest leathers for more than fifty years.

On any basis of quality, beauty, durability and genuine value, Duratex is the Better Automobile Upholstery.

A dominating National Advertising campaign is telling the motor buying public the real facts about automobile upholstery and what they have a right to expect from automobile manufacturers now that Duratex is available.

Write for prices and samples—and make arrangements to get the full value of the biggest automobile upholstery advertising campaign behind your selling.

The DURATEX COMPANY

Ira A. Kip, President

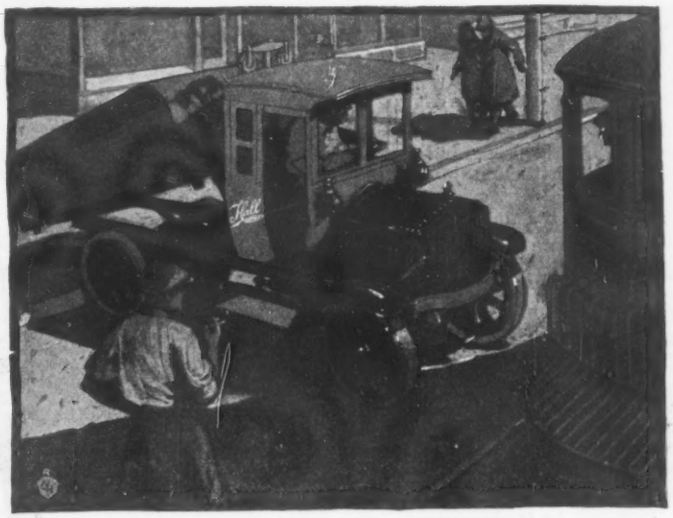
MAIN OFFICE AND WORKS NEWARK, N.J.

DURATEX

BRANCH OFFICE BOOK BUILDING DETROIT, MICH.

HAUL IT IN A HALL

The Hall "Short Special" Truck



ANNOUNCING

The New Hall "Short-Special" Truck

Especially Adopted for the Needs of Congested City Traffic

The Hall "Short-Special" meets an actual and vital demand. It fills a need in the work of city trucking that puts it in a class of its own. It reduces time of loading, haulage, delivery and consequently increases hour-mileage and lowers cost per ton haul—all points that spell increased service and operation economy for truck owners of every class.

Among the outstanding advantages of the Hall "Short-Special" truck in city work, is the fact that it will take the shortest street and alley turns easily and can be backed up to curbs on streets used by street car lines without interferring with the regular stream of traffic.

Write for folder which gives complete details and specifications. Address Sales Manager, 17 Roby St., Detroit, Mich.

LEWIS HALL IRON WORKS
DETROIT, MICH.

As Manufactured by
The LEWIS-HALL IRON WORKS
DETROIT, MICHIGAN.

On guard!

To protect your profits—
To protect your patrons—

Put the Wayne sentinel on *your* curb.

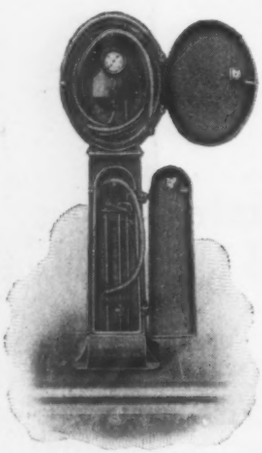
See the profits safeguarded by its perfect mechanism—continuous forward movement of handle giving speed and *service;* gear-driven indicator and meter insuring accurate measure and record; sturdy, solid construction, giving freedom from leakage and loss and maintenance expense.

These things have put Wayne Curb Pumps in the lead because dealer's profits are *safe* with the Wayne on guard.

And protect your patrons. Let them see what accuracy and speed and service mean; let them realize you are anxious to protect *them*—and they will form the *habit* of coming to you for gas and oil and air. And their trade means additional trade on everything else you handle.

Wayne outfits embody the highest mechanical development along these lines: push button quantity stops; counterbalanced, cylindrical sliding housing; six inch, clocklike discharge register; graduated computing scale; galvanized suction and fill lines, and *a two-year guarantee.*

Our factory is running at full capacity in an endeavor to meet the big demand for Wayne equipment. We must keep a close watch on Wayne quality, as it is Wayne quality that has created the demand.



Cut No. 11
For air and water at the curb

Wayne Products

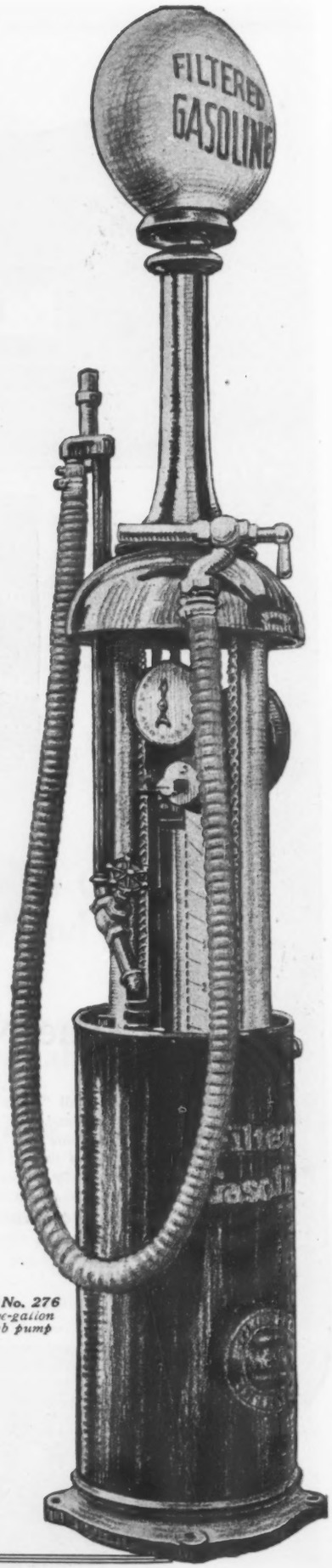
Measuring and non-measuring pumps

Portable wheel tanks	Dry cleaning systems
Oil storage systems	Underground tanks
Oil burning systems	Storage and control
Oil filtration systems	systems for liquids.

Furnaces for metal melting, metal forging and heat treating

Wayne

Honest Measure Pumps



Cut No. 276
Five-gallon curb pump

Write for Bulletins 276 MA and 11 MA and complete information

WAYNE OIL TANK & PUMP CO., 706 Canal Street, Ft. Wayne, Indiana

Sales Offices in All Large Cities—Representatives Everywhere

VIOLET RAY
AUTO LENS
LEGAL GLARELESS AND SAFE

The Blue Lens With Black Visor



"Something" is making Violet Ray the biggest selling lens in America

It may be the $3.00 price—

It may be the efficiency of the lens—

It may be the *blue* glass that looks so good.

Or it may be a combination of these things, seasoned with the backing of dealers who know how to push a good thing.

Whatever the reason, Violet Ray is selling—by the pair, by the hundreds of pairs and by the carload. IT WILL SELL FOR YOU.

Get in on this good thing while it is going big. Stock Violet Ray NOW

Write us or your jobber today



MORE LITE AUTO LENS

More-Lite lenses are now in service from Maine to California, over a million pairs of them. They give a soft diffused light that is legal everywhere, courteous and highly efficient.

No other lens at the same or near the same price can compare with them.

More-Lite Prices

6 to 8½ in.	$1.50	9⅝ to 10¼ in.	$2.00
8⅝ to 9½ in.	1.75	10½ to 11¼ in.	2.25

$3.00 Per Pair Any Size

West of Rockies $3.50 per pair, Canada $4 per pair

L. E. SMITH GLASS CO., Mt. Pleasant, Pa.

COMMONWEALTH
FOUR - FORTY

"Built in America—Girdles the World"

POSTAL TELEGRAPH – COMMERCIAL CABLES
CLARENCE H. MACKAY, PRESIDENT

RECEIVED AT
37 S. DEARBORN STREET
CHICAGO, ILLS.
TELEPHONES: WABASH 2980; LOCAL 99

TELEGRAM

DELIVERY NO.

The Postal Telegraph Cable Company (Incorporated) transmits and delivers this message subject to the terms and conditions printed on the back of this blank

This is a fast Day Telegram unless otherwise indicated by signal after the number of words:—"N. L." (Night Lettergram) or "Nite" (Night Telegram). 16Dbl—4571

69cha 11 114a

New York NY
Commonwealth Motors Co Chgo

Concensus of opinion of Domestic Dealers and Foreign Representatives visiting New York show that Commonwealth Four Forty is best value on exhibition Prominent Eastern Banker now financing one of our largest distributors inspected Commonwealth for its saleability and financial risk and assured me personally he would increase their line of credit one hundred and fifty thousand dollars based on his opinion of Commonwealths possibilities also expressed desire to invest money for other Commonwealth dealers Automobile Engineers and Manufacturers Representatives complimenting our construction Those not competitive referring their dealers to us Fifteen car loads sold to one dealer yesterday Ten car loads to another for immediate shipments indicate business possibilities confronting us

O N McCool
Sales Manager

First News from New York Show!



International Recognition Authoritative Tribute

Commonwealth Four-Forty is living up to its splendid reputation. It is fundamentally right in every detail; a tribute to the success of Commonwealth Automotive Engineers. It is the car that will sell in your territory. Ask quick to learn whether or not your Franchise is open.

COMMONWEALTH MOTORS COMPANY

Address General Offices: Chicago, U. S. A.
Factories: Joliet, Ill., U. S. A.

$1395

Sport-type, five passenger body, 117 inch wheelbase, full-floating spiral drive axle. Chrome-nickel Parish & Bingham Frame, insures safety and comfort. Six cross members reinforce every inch of extra heavy channel. 32 in. x 4 in. tires. Price, equipped, $1395 f. o. b. factory.

"The Car With the Foundation"

BOWSER

ESTABLISHED 1885

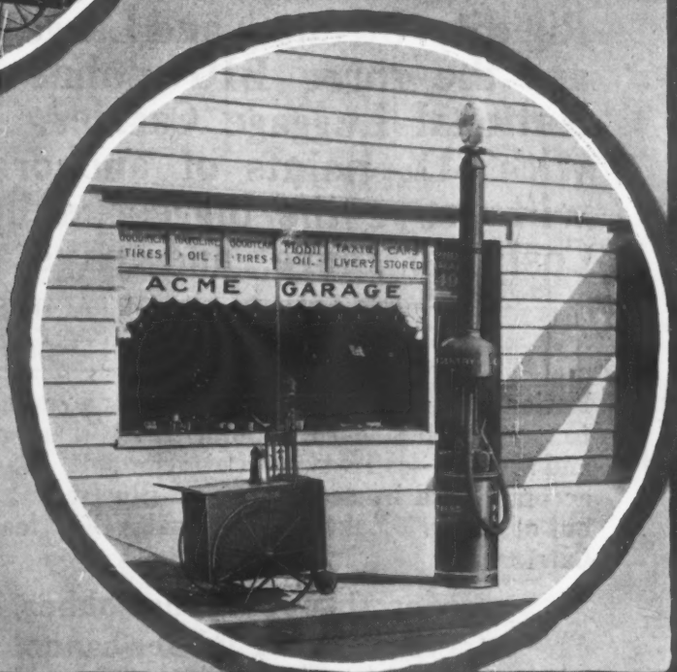


Garage men everywhere find Bowser Gasoline and Lubricating Oil Outfits pay handsome profits.

The big "Chief Sentry" 5-gallon Gasoline Pump and the Bowser Portable Lubricating Oil Outfit get the business.

All quantities are accurately measured.

Speed—Safety—Convenience—Profit, are always realized when Bowser Equipment is used.



Illustrations show the Bowser "Chief Sentry" Figure 102 Gasoline Pump and Figure 154 Portable Lubricating Oil Outfit. These two make a combination that cannot be surpassed for handling gasoline and oils at the curb.

Interesting literature will be sent on request.

LONDON
32 Victoria St., S. W. 1

HAVANA
Lonja del Comercio 427

S. F. BOWSER & CO., Inc., Fort Wayne, Ind., U.S.A.

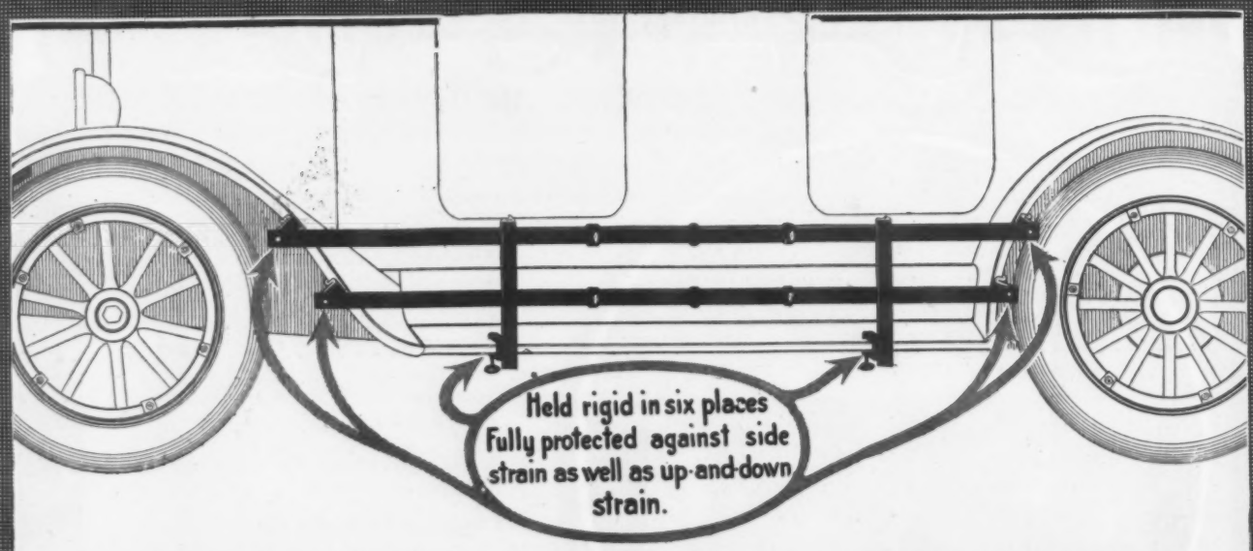
Branch Offices in 21 Cities of the United States

Canadian Office and Factory, TORONTO, ONT.

PARIS
5 Rue Denis-Poisson

SYDNEY
6 Castlereagh Street

6 point protection against strain



NATIONAL LUGGAGE CARRIER

Rigidity, Strength and Large Carrying Capacity are the three BIG points of merit in the National Luggage Carrier. Made of steel, with SIX points of anchorage, this Carrier will prove the biggest seller of the year. Costs no more, and pays standard profits.

ATTACHED OR DETACHED QUICKLY AND EASILY WITHOUT TOOLS.

National Luggage Carriers are so constructed as to be easily attached to any running board without tools. Fastened to both running board and fenders--solid type of attachment. The adjustment in length is accomplished by set screws as illustrated. Nothing to break or get out of order. Make the National YOUR leading accessory in Luggage Carriers.

Order through your jobber, or direct from factory if your jobber cannot make delivery.

National Manufacturing Co.

834 E. 7th St. Saint Paul, Minn.

Ease of Control



It is in heavy traffic where constant shifting of gears is necessary that one fully realizes the part the transmission plays in the motor truck or motor car.

Trucks and cars equipped with Covert Transmissions have little difficulty in heavy traffic.

Especially is this true of motor trucks.

Covert Transmissions are designed to make shifting of gears easier as well as to transmit a constant flow of power to the rear axle.

Covert Gear Company, Inc.
Sales and Engineering
967 Woodward Avenue, Detroit, Michigan
Factory: Lockport, N. Y.
Export Office: 100 Broad Street, New York

"There is No Weak Point in a Covert"

COVERT TRANSMISSIONS


FAFNIR
YES, Mr. Prospect, the real purpose of anti-friction bearings is to reduce friction as much as is possible, and every engineer knows that the ball bearing is by far the most nearly frictionless type of bearing known to man.
Moreover, because the ball bearing is so nearly frictionless, it is virtually wearless and is the most durable type of bearing in existence.
Fafnir Ball Bearings are in every detail as good as human skill can produce.
THE FAFNIR BEARING COMPANY
Conrad Patent Licensee
New Britain, Conn.
DETROIT Office: 752 David Whitney Bldg.
CLEVELAND Office: 916-917 Swetland Bldg.
CHICAGO Office: 1919 So. Michigan Ave.

Allis-Chalmers
Farm Tractors



Does 4-Plow Work at Less Than 3-Plow Costs

The Allis-Chalmers 18-30 plows at 2.8 miles an hour. The plowing width of four 14 in. bottoms is 4.75 feet. There are 5280 feet in a mile and there are 43,560 square feet in an acre.

This gives the Allis-Chalmers 18-30 a total plowing capacity of 1.61 acres an hour under average conditions.

1.18 acres an hour is the capacity of any three-plow tractors under the same condition.

Burning kerosene, the average fuel consumption of the Allis-Chalmers 18-30 is 2.5 to 3 gallons an acre, depending entirely on soil conditions.

The average fuel consumption of 3-plow tractors is about the same—the Allis-Chalmers 18-30 performance is due to the remarkable fuel efficiency of the Allis-Chalmers motor, built in our own shops.

In competitive tests with all of the better known farm tractors, the Allis-Chalmers proved a per acre cost for fuel and oil of $0.35 an acre.

The average for the 3-plow tractors was $0.49 with the lowest cost $0.37.

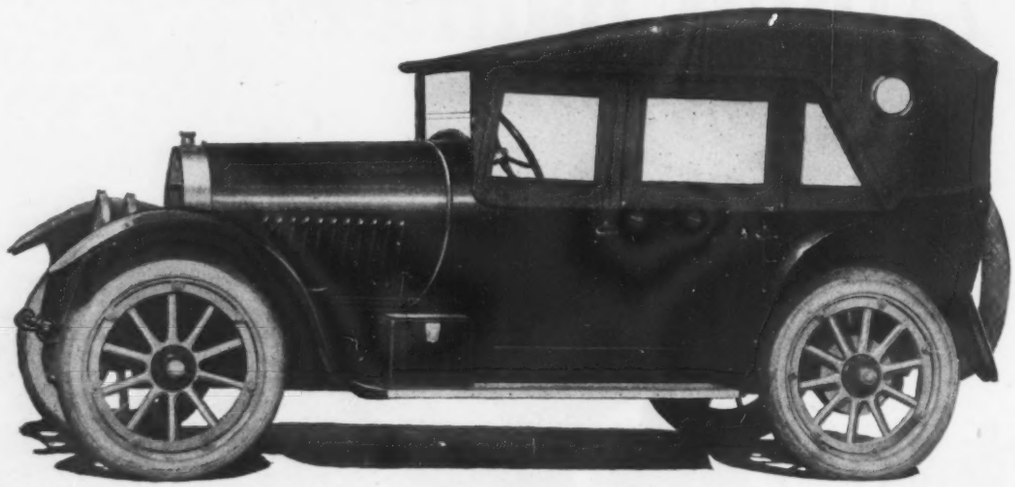
After plowing is done, the Allis-Chalmers affords the same high working ability at the same low cost for other farm work.

The tractor you can sell at the greatest profit to yourself is the tractor that will give the greatest satisfaction to the men you sell it to. And this is the Allis-Chalmers.

Among the lighter powered tractors the Allis-Chalmers General Purpose 6-12 affords the same comparative working ability and gives a tractor with 26½ inch clearance for cultivating.

ALLIS-CHALMERS MANUFACTURING CO.

Dept. M. A., Tractor Division **Milwaukee, Wisconsin**



The Car with the Aeroplane Type Motor

THE keenest minds in the automobile industry today agree that the successful car of the future will be light in weight, stripped like a thoro-bred of every useless ounce of incumbrance, yet of such superfine quality in workmanship and material as to achieve dependability and durability, never attained heretofore by the use of heavy masses of steel.

The Nelson is an advanced type of car that fits this prediction exactly.

The Nelson combines every factor that makes a car a successful sales proposition. It is designed and built by E. A. Nelson, who became famous the world over as the designer and builder of the Hupp-20 and Hupp-32. This in itself is a guarantee of the car's thoro reliability. Behind Mr. Nelson is a company which will satisfy even the most exacting dealer as to its personnel, financial and manufacturing strength, capable of a production which will make a distributor's or dealer's contract an exceedingly valuable asset.

The car is light in weight—only 2100 pounds for the touring car, with a speed range which has never been approached by a light car before and a gasoline and tire economy that will sell it on sight.

Twenty-five miles to the gallon or more—trials under normal driving conditions are continually showing records of much higher than this. 15,000 miles on a set of tires is a fair average.

In appearance, the Nelson is equally far advanced, favoring somewhat the snappy, European car, with curtains that open and close with the doors, plate glass windows, fitted and equipped throughout strictly in keeping with the most costly cars.

The motor is Nelson's own design—valve-in-head, overhead cams and high pressure oil feed direct to all bearings.

It is safe to predict that the Nelson selling franchise will soon be considered one of the most valuable contracts in the automotive field.

We invite the better grade of dealers to communicate with us regarding terms and territory.

See the Nelson during the show at the sales rooms of the Illinois distributor, 2807 Michigan Avenue

E. A. NELSON MOTOR CAR COMPANY *500 Bellevue Ave., Detroit, U. S. A.*

NELSON



Through the Ozarks with Autowline!

The Tale of a 55 Mile Tow-Home

You motorists who for some reason or other have been putting off the buying of a Basline Autowline—read of the experience of Mr. Guy Oliver, of the Oliver Electric Co., St. Louis, who writes us as follows:

"That slogan 'The Little Steel Rope with the Big Pull' is certainly appropriate for your Basline Autowline. *I know!*

"Last month I was driving my touring car out around St. Clair, Mo., when I had a serious breakdown.

"Luckily, a friend happened by in a 48-Pierce-Arrow and he offered to tow me in to St. Louis, a distance of 55 miles, with an Autowline.

"If there are any rougher roads anywhere than in the foothills of the Ozarks, I'd like to see them. Frankly, I was very skeptical about your Autowline standing the gaff of that long, hard journey home.

"But home we finally did reach, thanks to Autowline, and the whole affair made such an impression on me that I am writing you about it. If there is anything a motorist really ought to carry with him all the time, it is Autowline. It's like a life preserver—not thought about until needed, and then you simply can't get along without it."

BASLINE AUTOWLINE is made of famous Yellow Strand Wire Rope—snaps on instantly with patented Snaffle hooks that hold securely. At dealers, $5.80, east of Rockies. Be on the safe side—get one today.

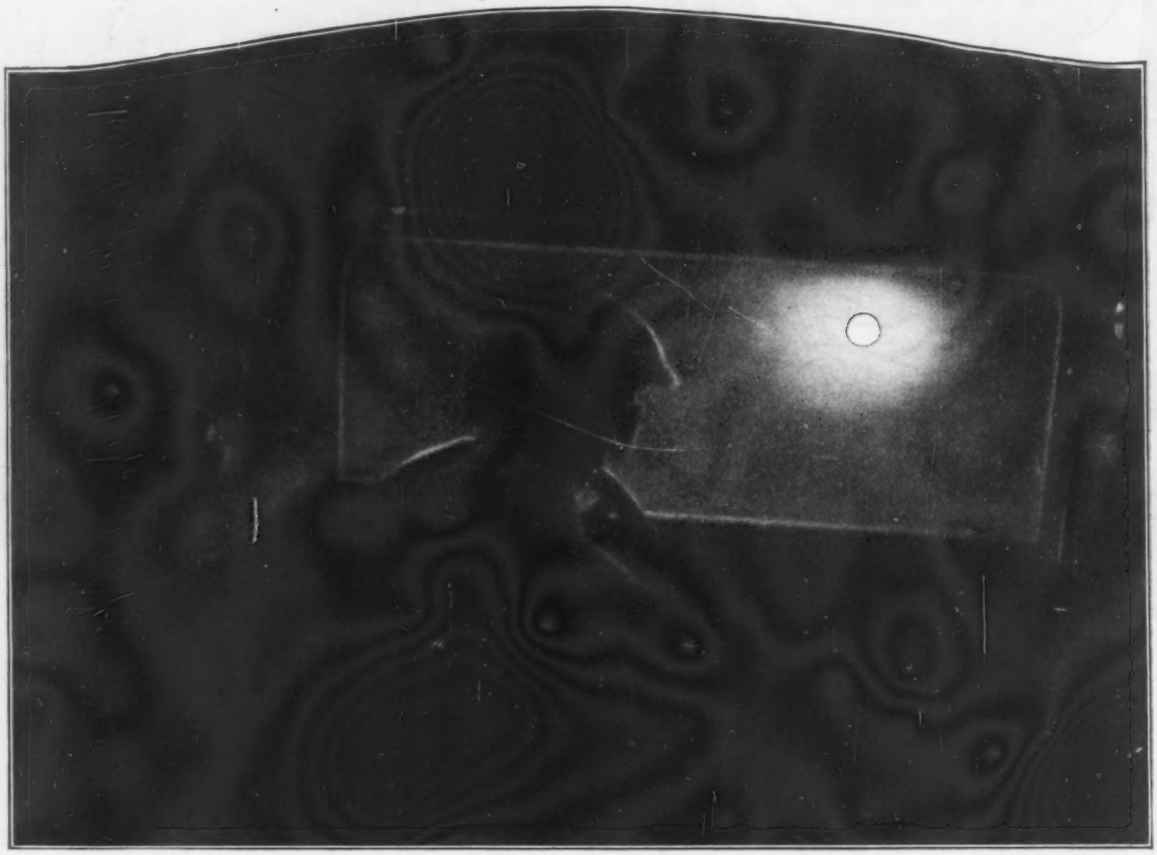
BRODERICK & BASCOM ROPE CO. ST. LOUIS NEW YORK

Also Manufacturers of Powersteel Autowlock and Powersteel Truckline

C-508

MAZDA

"Not the name of a thing, but the mark of a service"



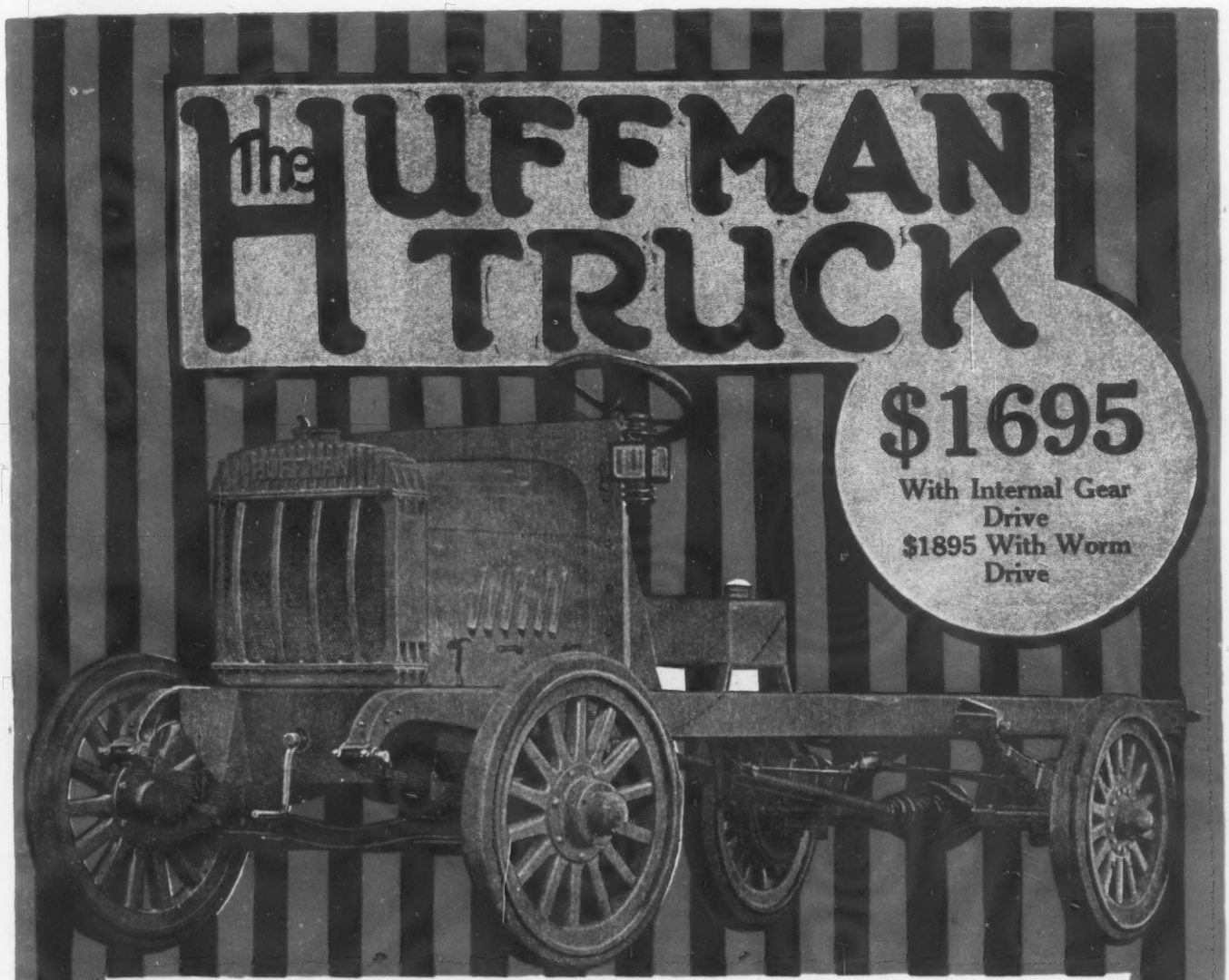
What is it?

Motorcycle or car? If it is a car, which lamp is out—left or right? Lamp-unreliability is both **dangerous** and unnecessary. The known high standards of MAZDA Service are sufficient to make the cautious and considerate insist on having MAZDA Lamps—**lamps marked Mazda.**

MAZDA is the trademark of a world-wide service to certain lamp manufacturers. Its purpose is to collect and select scientific and practical information concerning progress and developments in the art of incandescent lamp manufacturing and to distribute this information to the companies entitled to receive this service.

MAZDA Service is centered in the Research Laboratories of the General Electric Company at Schenectady, N. Y. The mark MAZDA can appear only on lamps which meet the standards of MAZDA Service. It is thus an assurance of quality. This trademark is the property of the General Electric Company.

RESEARCH LABORATORIES OF GENERAL ELECTRIC COMPANY



We Are Selling Our Truck at a Business Getting Price

All unnecessary costs in the production of Huffman Trucks have been eliminated. A modern factory, latest design in tools and machinery, approved production methods —all play their part in producing a truck of 2,000 to 5,500 lbs. carrying capacity, including body weight, that can be sold for $1695. This price has a business getting value for dealers. And the price is backed up by Huffman performance—speed and flexibility for light loads; power and strength for heavy loads.

Your territory may be open. Wire or write for our complete proposition.

GENERAL SPECIFICATIONS

MOTOR—Model B 4-cyl. Continental Red Seal.
MOTOR—Model C 4-cyl. Buda.
IGNITION—Dixie High Tension Magneto.
CARBURETOR—Zenith.
CLUTCH—Fuller, dry disc type.
TRANSMISSION—Fuller, Unit Power Plant Type.
STEERING GEAR—Lavine Irreversible.
FRAME—Hydraulic Pressed Steel Channel.
FRONT AXLE—Drop Forging with Timken Bearings.
REAR AXLE—Torbenson Internal Gear or Standard Worm Drive.
SPRINGS—Perfection—Special Design.
TIRES—Firestone.
WHEELBASE—140 inches.
LOADING SPACE—10½ ft. from rear of seat to end of frame.
CHASSIS WEIGHT—3200 lbs.

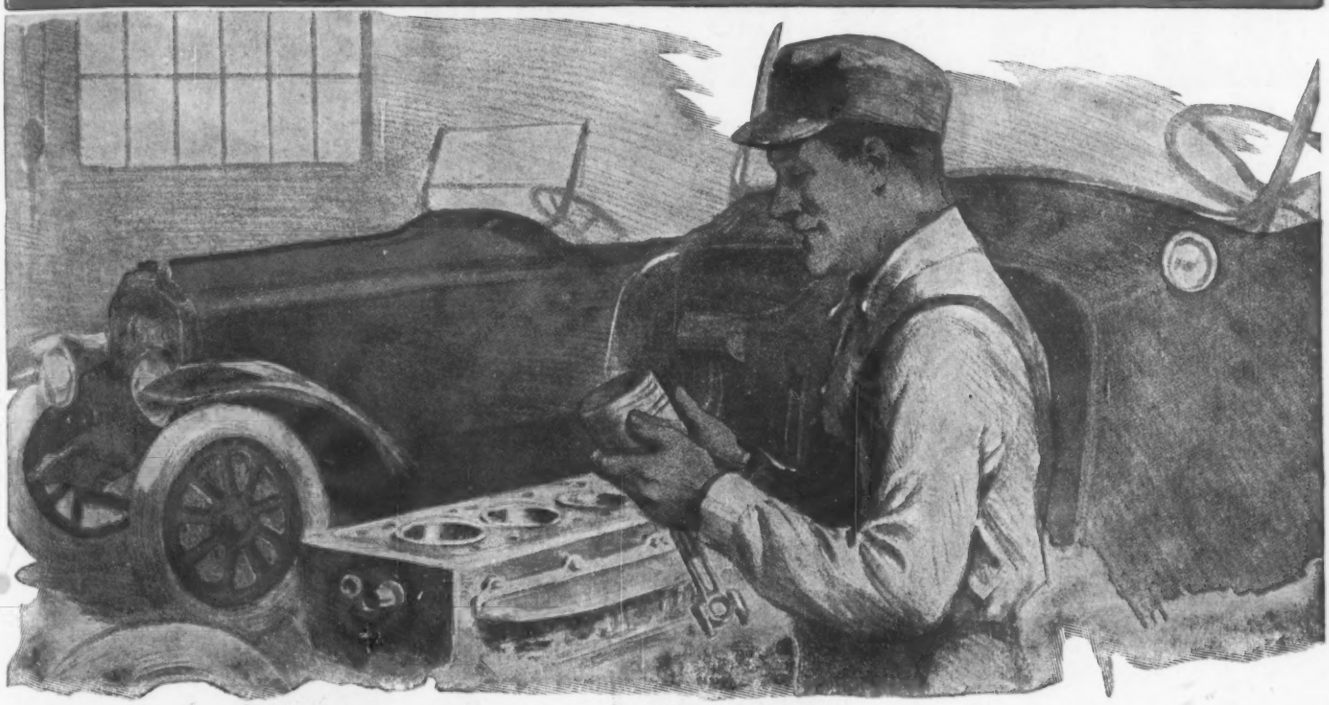
HUFFMAN BROTHERS MOTOR CO.

Main Office and Factory
ELKHART, IND.

Branch and Showroom
2425 Michigan Ave., Chicago, U. S. A.

WE ARE EXHIBITING IN THE COMMERCIAL SHOW AT CHICAGO


The Guarded Opening
TRADE MARK REG.
BURD
High Compression
PISTON RINGS
PAT. APR. 7.14
The World's Standard of Piston Ring Efficiency



Why Take Chances?

As an expert mechanic—you know that carbon causes 98% of all engine trouble. You know also—that carbon is caused by leaky piston rings—which pump oil into the cylinders, where it does not belong. Lubricating oil does not explode—it burns—and forms carbon deposits. Carbon is an abrasive—like emery. If it is allowed to accumulate—it pits the valves and valve seats, produces abnormal wear of cylinders, pistons, piston rings and all engine bearings—causes faulty ignition, loss of compression and power—waste of gas and oil. In time it ruins the entire motor or makes regrinding and general overhauling absolutely necessary.

Install BURD Piston Rings

Approved by the World's Greatest Automotive Engineers

You can safely recommend BURD High Compression Piston Rings to your customers. They were selected for use in the Aviation Service—by the world's greatest automotive engineers—after the most rigid competitive tests. 16,000 Commissioned American Aviators, 5,000 Canadians and thousands of French and British Aviators learned to fly in planes equipped with BURD Piston Rings during the war, where efficiency was vital—because life was at stake.

BURD Piston Rings are easy to install—fit accurately to .00025 of an inch—are *guaranteed* against flaws and breakage—and warranted to produce higher compression and develop more power with less fuel and lubricating oil than any other piston ring made. The BURD Patented Guard Automatically Compensates for Wear and insures oil tight—gas tight—high compression—freedom from carbon trouble and a clean, economical, highly efficient engine.

Write for 1920 BURD Piston Ring Directory

It gives complete piston ring information, sizes and oversizes for practically every make and model engine for automobiles, trucks, motor boats, tractors, etc., with instructions for installing and scores of helpful hints and suggestions for mechanics.

All Jobbers Carry Complete Stocks—To Fill Rush Orders

Write to our Engineering Department for any information you want regarding special sizes or oversizes. This factory service is at your command—at any time—without charge.

BURD HIGH COMPRESSION RING COMPANY, Rockford, Ill., U. S. A.

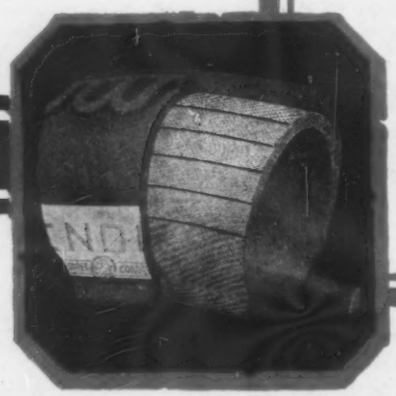
America's Foremost Manufacturers of Piston Rings

BRAENDER



Getting Customers Who Come Back

WE take it for granted that you expect the tires you sell to bring you repeat orders. Transient trade is surely an item, but the steady, satisfied customers who come back are the ones you bank on to pay the rent and buy the family shoes. We are wise enough to know that unless our BRAENDER TIRES make good with your customers, we can't expect to make good with you, therefore we make those tires "right" because we realize that it would be a slow form of business suicide to make them any other way.



CORD AND FABRIC TIRES



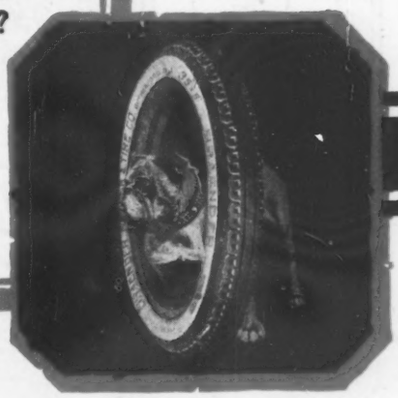
Our New Selling Plan Moves Tires

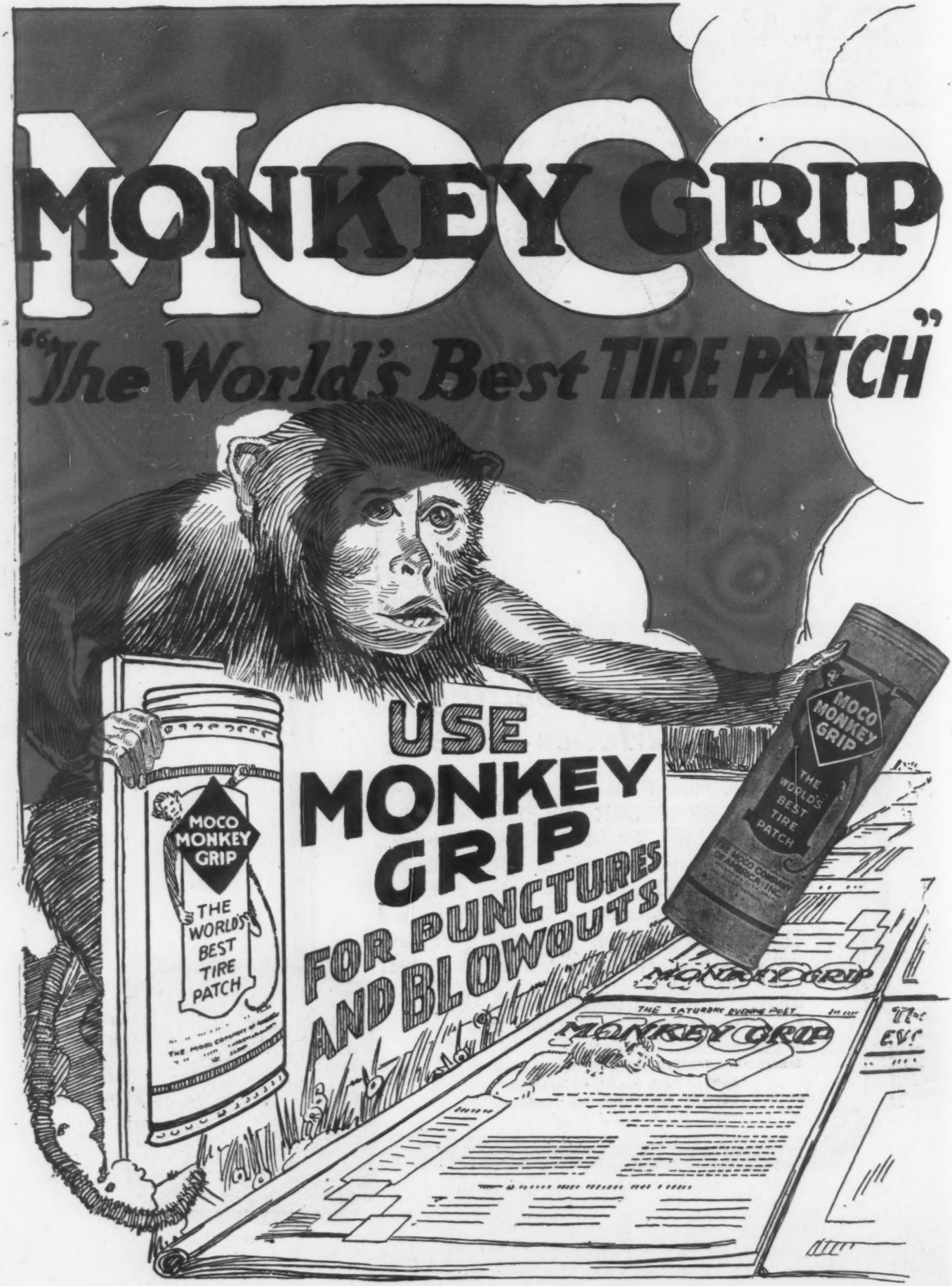
WE firmly believe that the new BRAENDER selling plans will strike you favorably. We fully realize that to keep the dealer's interest we must help him sell tires. It's such a simple plan. First—tires that stand up. Second—advertising that sells tires, and Third—more profit for the dealer. We have still some territory open. **Are you interested?**

BRAENDER RUBBER & TIRE CO.

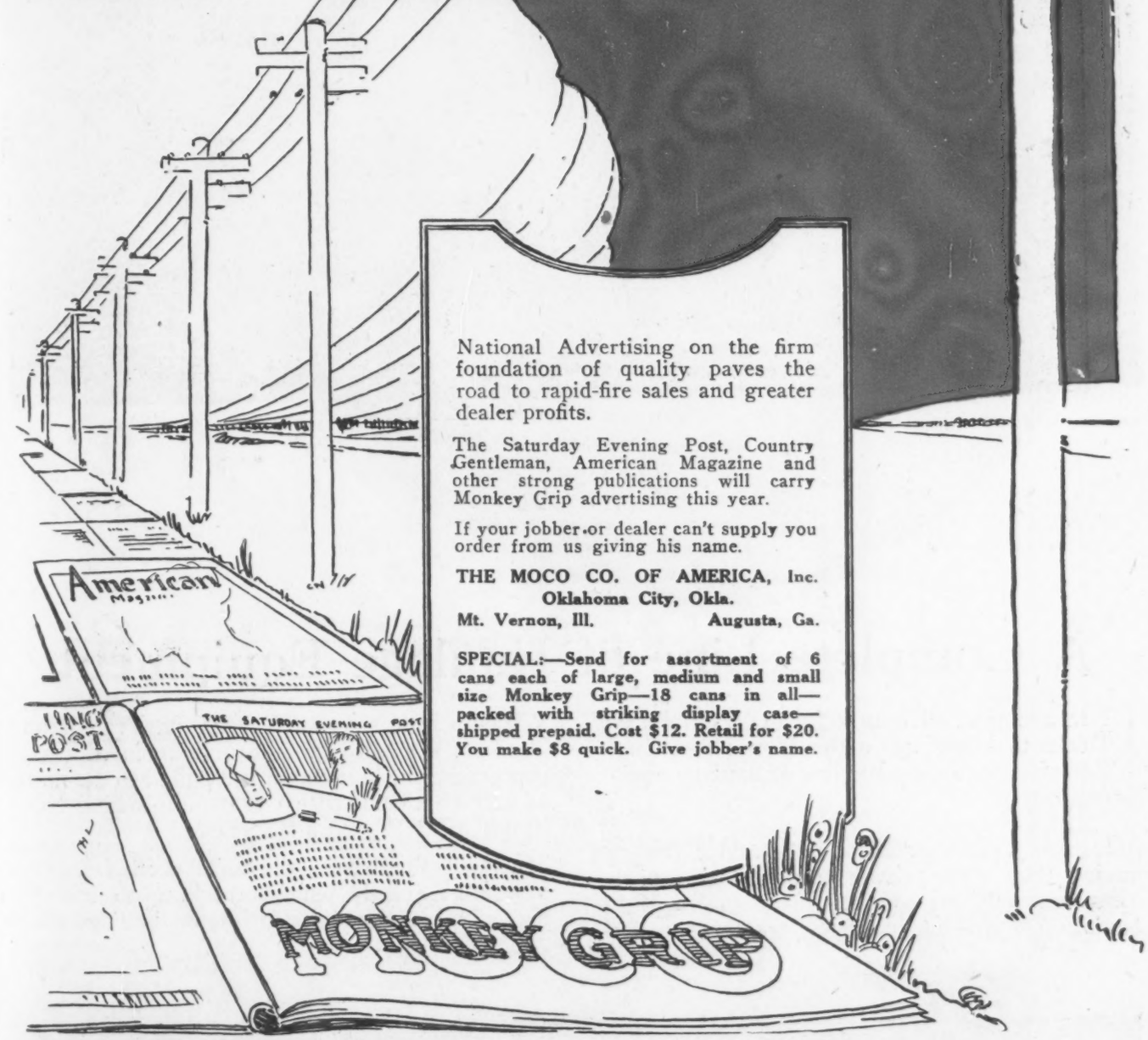
Factory: RUTHERFORD, NEW JERSEY, U. S. A.

Branches: 32 Broadway, New York
1352 W. Girard Ave., Philadelphia
64 East 14th Street, Chicago
131-133 8th Street, San Francisco




MOCO
MONKEY GRIP
"The World's Best TIRE PATCH"
USE MONKEY GRIP FOR PUNCTURES AND BLOWOUTS
MOCO MONKEY GRIP
THE WORLD'S BEST TIRE PATCH
MOCO MONKEY GRIP
THE WORLD'S BEST TIRE PATCH
MONKEY GRIP
THE SATURDAY EVENING POST
MONKEY GRIP

Paves the Way to Better Tire Service and Satisfaction



National Advertising on the firm foundation of quality paves the road to rapid-fire sales and greater dealer profits.

The Saturday Evening Post, Country Gentleman, American Magazine and other strong publications will carry Monkey Grip advertising this year.

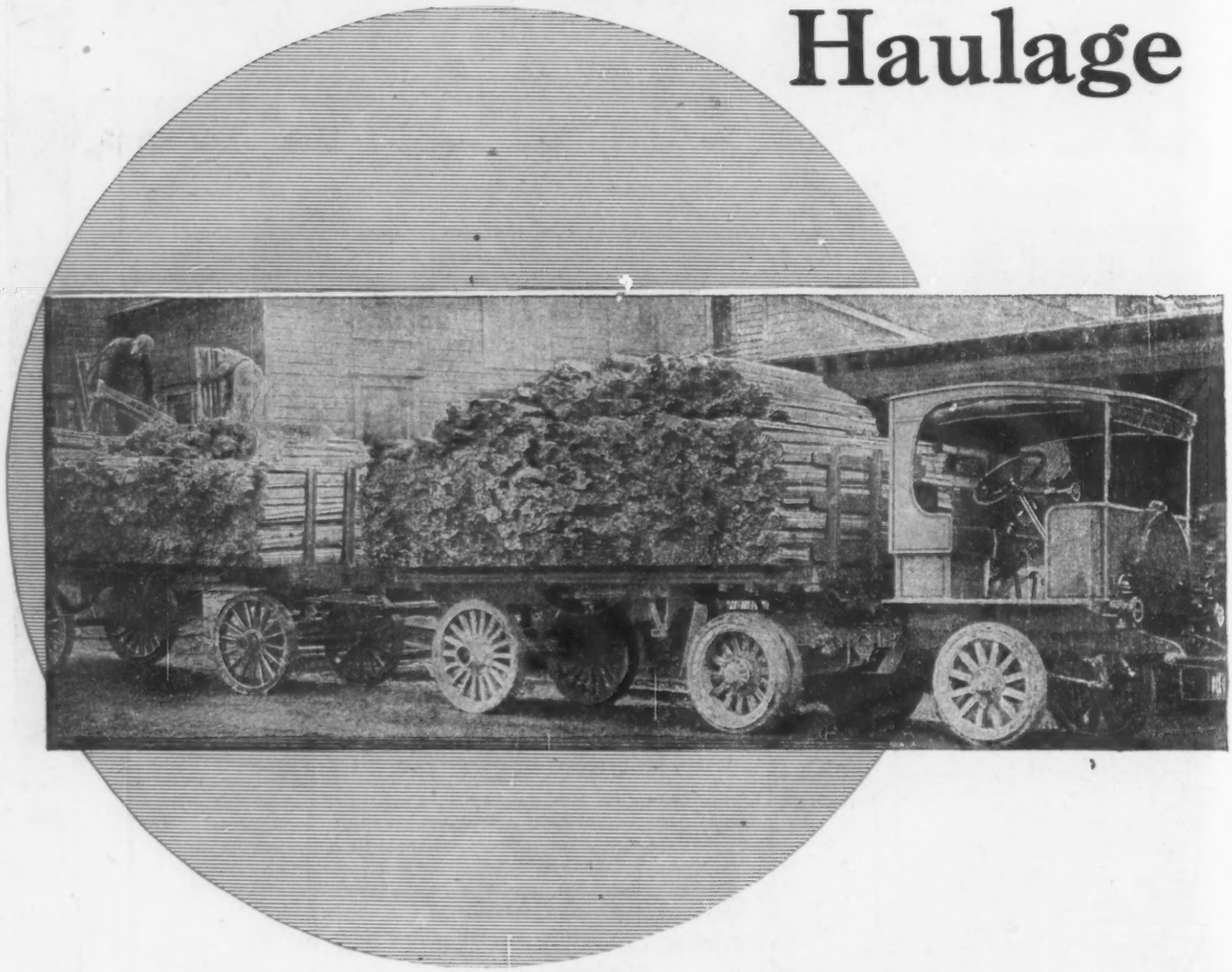
If your jobber or dealer can't supply you order from us giving his name.

THE MOCO CO. OF AMERICA, Inc.
Oklahoma City, Okla.
Mt. Vernon, Ill. Augusta, Ga.

SPECIAL:—Send for assortment of 6 cans each of large, medium and small size Monkey Grip—18 cans in all—packed with striking display case—shipped prepaid. Cost $12. Retail for $20. You make $8 quick. Give jobber's name.

WATSON

Haulage



A Complete Line of Haulage Equipment

IT IS a distinct advantage for the User and the Dealer to do business with a House big enough to manufacture a complete line of haulage equipment.

Industrial Concerns, Merchants and Farmers, having their own private transportation problems, naturally are anxious to adopt the right haulage system—be it trucks, tractors, trailers or what not.

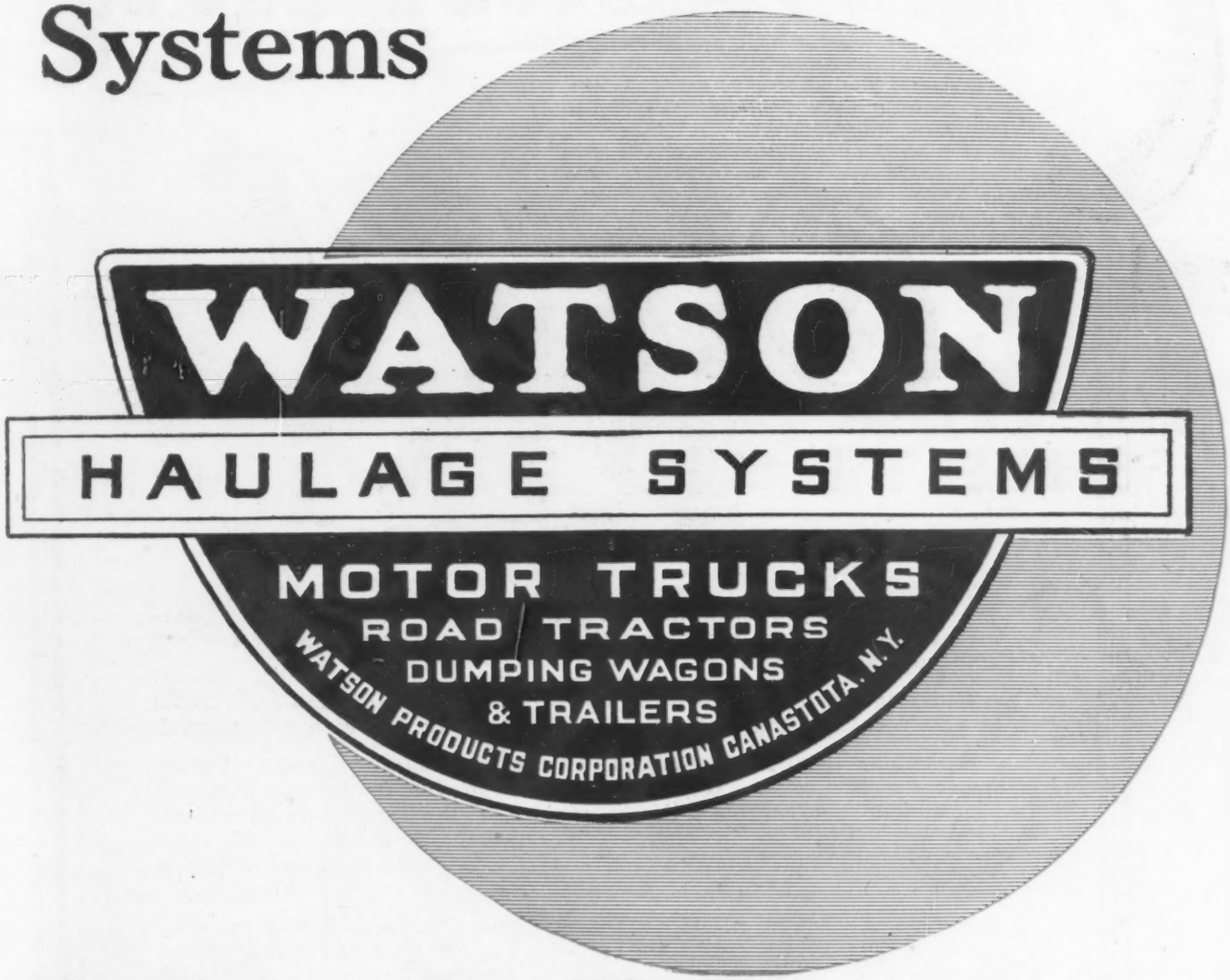
With its four sizes of Trucks, its Tractor and Trailers, Watson is able to give unbiased advice concerning the best equipment suited to the needs of each particular case. Watson is selling NOT simply a UNIT, but a SYSTEM.

The line is flexible and covers all needs from that of a small, speedy delivery truck, up to that of a fleet of mixed mastodons of heavy haulage.

Write for particulars.

WATSON

Systems



This Mark on Your Window

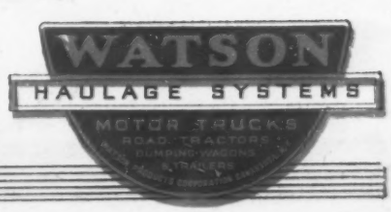
THIS indentification Mark on a dealer's window is a notice to all who pass that not simply "trucks" are sold there, but that complete haulage systems, flexible enough to suit all practical needs, are obtainable within.

It is a symbol of breadth as well as character of service.

For the dealer it means a HUMAN relation with a manufacturer, the fundamental basis of which is a sincere desire for cooperation and a HUMAN understanding of the dealer's problems.

That Mark is worth having; for it means much and in many ways. Write for particulars.

Watson Products Corporation, Canastota, N. Y.



Announcing

Oliver

DOUBLE JOINTED

RIM

The biggest improvement in rim construction since demountable rims were invented—a two-piece rim designed *scientifically* after months of research and experimental work.

A tire equipped with the OLIVER Double Jointed Rim can be removed in a fraction of the time and with infinitely less work than by the old method.

Everything about this rim is figured out to mechanical exactness. For instance, the straight cut across the base of the rim gives the sections butt ends for maintaining strength and the diagonal cut on the flanges permits an easy, quick removal. A snugly fitted lever fastened to one section and lapping a pin on the other holds the two parts as firmly as a solid piece and positively prevents any chance of rattling or squeaking.

In every respect, the OLIVER Double Jointed Rim is a decided improvement. It is a well designed, well built rim with an exclusive selling feature that means bigger rim business for dealers.

Here, at last, is demountable rim perfection. Experts have been generous in their approval of this remarkable invention.

It is decidedly to your advantage to get the complete story of OLIVER Double Jointed Rims. Drop us a line for full particulars of our dealer proposition.

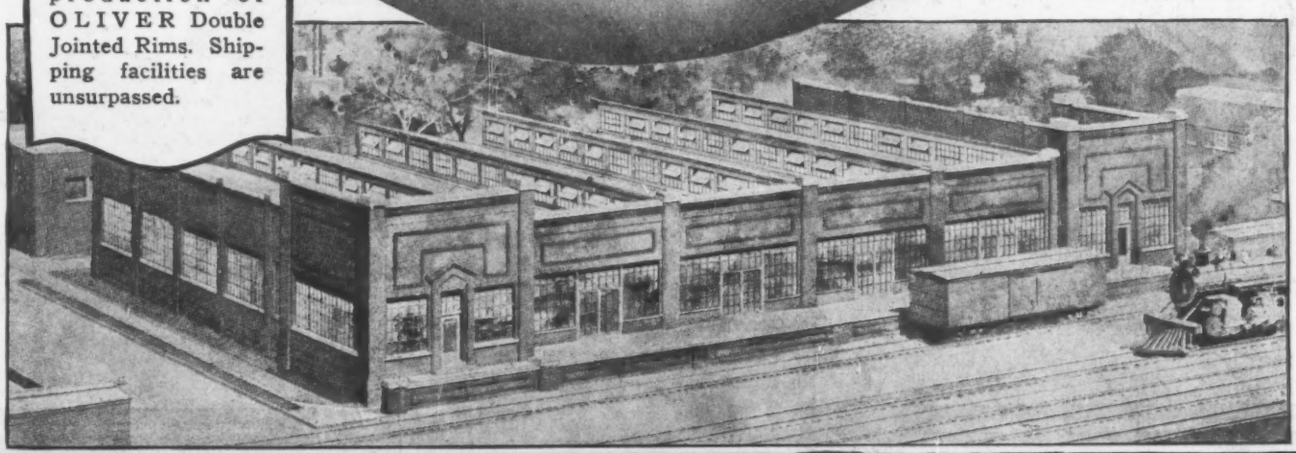
OLIVER RIM COMPANY

ATLANTA, GA.



Our Factory

Situated on a site of eleven acres. Modernly equipped in every way for the speedy and efficient production of OLIVER Double Jointed Rims. Shipping facilities are unsurpassed.



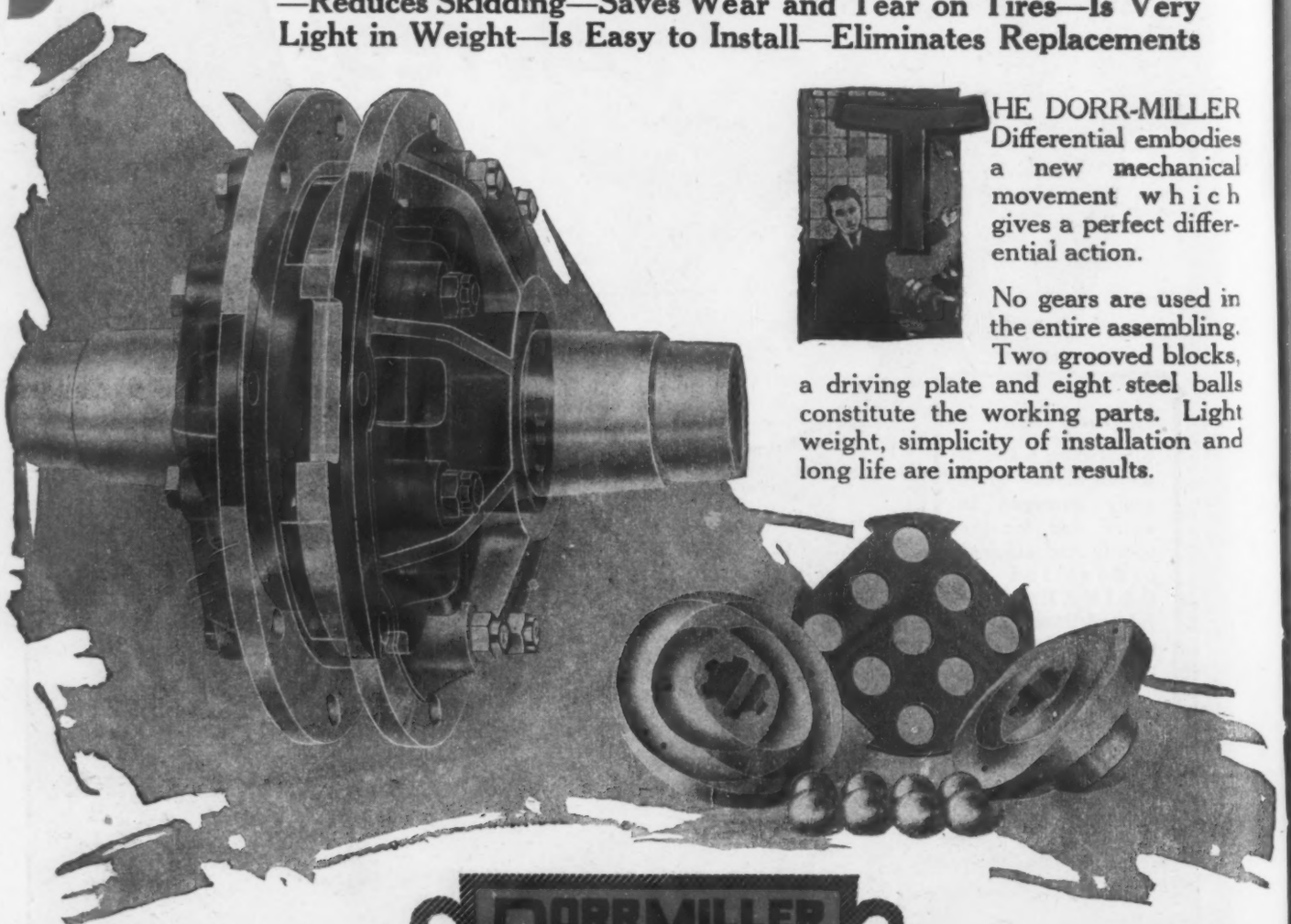
DORR MILLER DIFFERENTIAL

facts—

The Dorr-Miller Differential Prevents Spinning of Rear Wheels —Reduces Skidding—Saves Wear and Tear on Tires—Is Very Light in Weight—Is Easy to Install—Eliminates Replacements

THE DORR-MILLER Differential embodies a new mechanical movement which gives a perfect differential action.

No gears are used in the entire assembling. Two grooved blocks, a driving plate and eight steel balls constitute the working parts. Light weight, simplicity of installation and long life are important results.



DORR MILLER DIFFERENTIAL

DORR MILLER DIFFERENTIAL

The Dorr Miller Differential Delivers Maximum Application of Power By Utilizing 100% of Traction

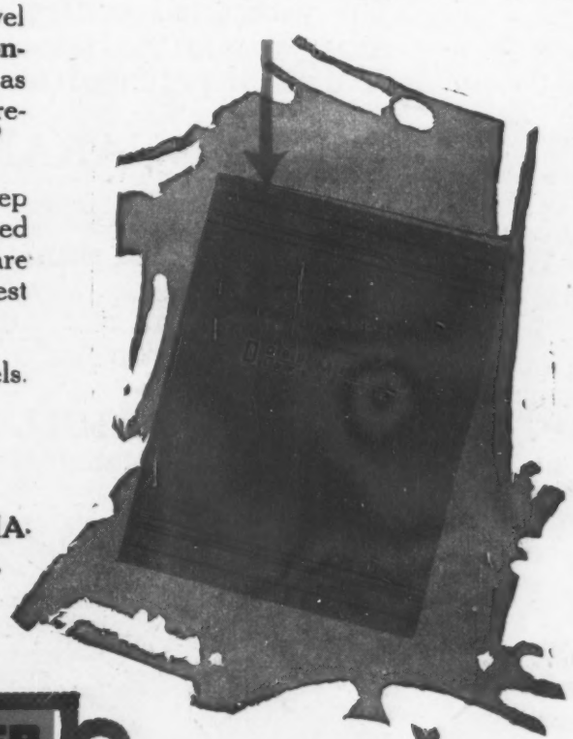
How often have you seen one of the rear wheels of a car spinning on a smooth pavement due to sudden application of power and varied traction? You will agree that a differential which makes this impossible has a powerful selling feature—and that differential is the Dorr-Miller.

No matter what the road conditions may be—sand, mud, gravel or slippery pavement—the Dorr-Miller keeps the power **constantly and uniformly** applied to driving wheels. So long as one wheel has traction, **neither** wheel can spin. Greatly reduced wear and tear on tires is the natural result.

In every way the Dorr-Miller Differential represents a big step forward in differential design and construction. Increased economy and efficiency for the car, truck or tractor owner are features of this differential that make it of decided interest to you.

Write for our latest booklet describing in detail various models. Our Chicago Show Space is 7 Coliseum.

This Booklet Illustrates Various Models — A Copy Will Be Sent to Established Dealers





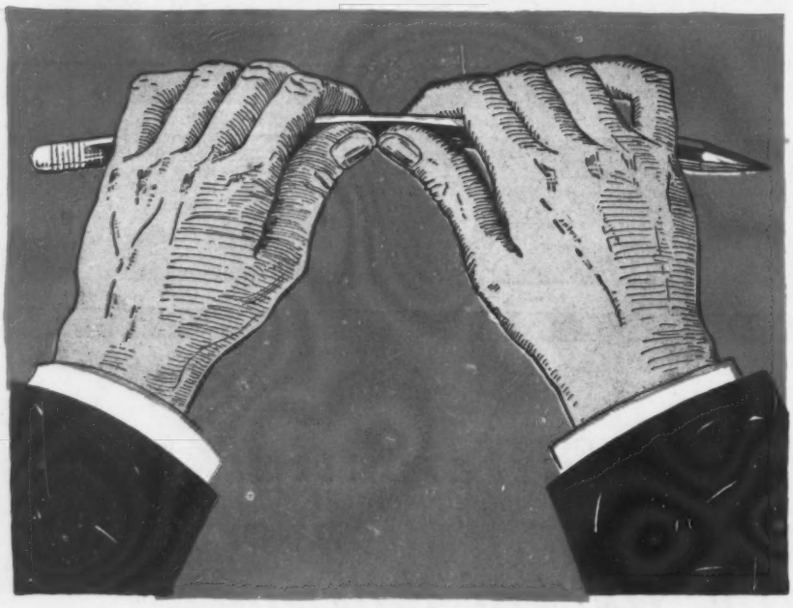
A truck, tractor or motor car equipped with a Dorr-Miller Differential can pull out of any difficulty so long as one rear wheel has traction.

THE FOREST CITY MACHINE & FORGE CO.

CLEVELAND
OHIO

DORR MILLER DIFFERENTIAL

Where Will This Pencil Break?



At the center of course—

So it is with your automobile spring, loaded at both ends and supported at the center, at which point all springs except the Titanic are weakened by center bolt holes or by center nibs.

No weakened center in Titanic springs! No holes, no nibs—just an arch, the surest kind of elastic construction. A Tuthill patented feature, by which we are enabled to

GUARANTEE FOREVER

against center breakage. Assurance of satisfaction to your customer, and of profit to you.

Right near you is a Tuthill Spring Distributor—his name is in Chilton's or Auto Trade Directory.

TUTHILL SPRING COMPANY
Established 1880 760 Polk St., Chicago, Ill.





Co-Operation That Sells Patches



Every dealer who sells Wood's Everloc appreciates the strong sales-making co-operation that has been a part of Wood's policy ever since the patch was introduced. In little ways and big ways, Wood believes in helping the dealer—it sells more patches.

Our counter card is one instance of Wood's co-operation. It is handsomely and durably made of celluloid—finished in two colors—a constant reminder to your customers to buy Wood's Everloc. When you stock Wood's Everloc this little sales booster will do mighty good work for you.

Wood's Everloc is the original self-vulcanizing patch. It is made of pure para rubber, backed with US Khaki—a feature that has made the patch famous. No heat or tools are required—in three minutes puncture or blowout in tubes up to 17 inches can be repaired permanently.

Four sizes—$.50, $1.00, $1.50, and special Garage Size.

Any jobber can supply you

Postal to us gets you Woods Dealer Helps

W. C. WOOD CO.

105-107 Western Ave., Minneapolis, Minn.

Atlas

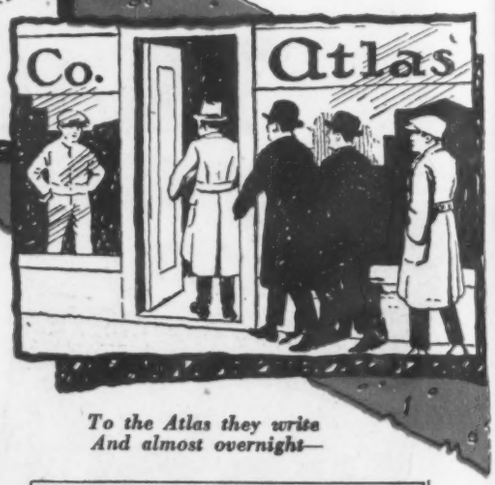


Many dealers have viewed
The way that Fords stewed

Any Ford driver will gladly hand you the price of a cooling device that frees him from the nuisance of a freezing, boiling, steaming Ford and danger of permanent damage and expense.



Which suggested a way
They could make this fact pay



To the Atlas they write
And almost overnight—

An Adequate Cooling System for Fords

From the factory of one of the biggest makers of cooling systems for high priced cars comes the right idea for a successful Ford water circulating pump. It's identical in design with the larger ones—just changed to Ford size. There's nothing delicate to get out of order—the same high grade material and accurate workmanship are used on the Atlas pump for Fords as on the pumps made for costliest motors. Ford owners are quick to recognize this pump's advantages—and their satisfaction will bring you other customers.

How the Atlas Is Installed

Simply take out the two bolts that fasten water outlet to cylinder jacket, slip in pump bracket and gasket; screw up two bolts; fasten water connections and slip on fan belt. Nothing simpler. Entire installation equipment including Copper Asbestos Gasket, fan belt, hose and fasteners, is furnished complete with each Atlas Special Pump.

Centrifugal Water Circulating Pump for Fords

Dealers everywhere who have taken on the Atlas Centrifugal Water-Circulating Pump for Fords say it's one of the biggest sellers of the season. Its simple construction and correct cooling principle make every prospect a purchaser. You can easily demonstrate an actual saving that soon repays the cost of the Atlas.

Take Advantage of This Profit-Making Chance for Dealers

Every Ford that passes your doors represents a sale and neat profit for you if you handle the Atlas Centrifugal Water-Circulating Pump. It sells at a price you can easily get—with a generous margin of profit.

Your first order brings you our complete line of handsome window hangers and folders, that hook up with our direct-to-user advertising to build increased sales for you. Don't delay investigating this money maker.



Sales increase with a bound
As the Fords gather 'round.

Why don't you do the same—
Get more cash "in your name."

Mail Coupon for Attractive Proposition

Let us send you full information about the Atlas Pump and our liberal dealer offer. Get the facts and decide for yourself what this accessory means to you in dollars and cents. There's no obligation—put your name on the coupon and send it.

The Atlas Brass Foundry Co.,
991 S. Front Street
COLUMBUS, OHIO

The Atlas Brass Foundry Co.,
991 S. Front Street,
Columbus, Ohio.

Please send full information and dealer offer on your Atlas Water Pump for Fords.

Name .....

Address .....

Jobber's Name .....

Jobber's Address .....

From New York to Bombay



From coast to coast—and further yet, from New York to Bombay—has spread the fame of the AMERICAN Balanced Six.

The chain of its distributing agencies and service stations now reaches across the continent and into distant lands. Even far India and the Antipodes have fallen under the magic spell of America's Smile Car.

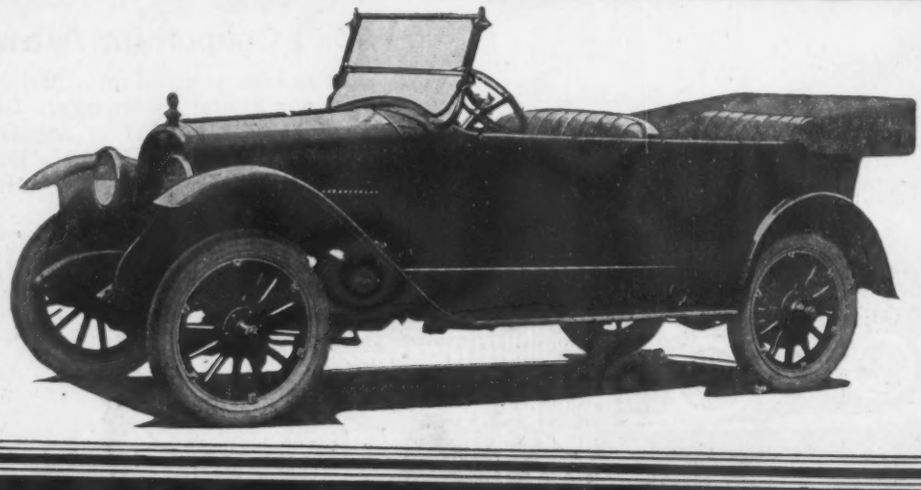
The whole wide world pays tribute to its superiority. Leaving a record of Miles of Smiles wherever it goes, the AMERICAN Balanced Six has won its way to a commanding place among cars of its type.

In direct recognition of this fact the demand for this car has grown within the short space of six months to a point where its factories will no longer suffice and, as a result, The American Motors plants at Plainfield, New Jersey, is now being doubled in capacity and plans are already under way for the construction of an additional building which will again double its capacity.

This is the visible evidence of AMERICAN superiority, which rests primarily upon the Balanced construction of the AMERICAN Six.

The AMERICAN Balanced Six is the first instance in which the principle of balance has been *correctly* applied in the construction of cars of light weight.

By a scientific distribution of weight the load is divided over each of the four wheels almost to a fraction of a pound. The chassis is not overweighted at the front nor underweighted at the rear. Each wheel carries an equal share of the load.



122-inch Wheelbase
45 Horsepower

Touring Cars
Roadsters
Sedans

AMERICAN

MILES OF SMILES

The Smile Car at the Shows

At the National Automobile Shows the cover will be lifted off the new Smile Car.

We predict that this car is destined to make the possessors of its franchises during 1920 a lot of happy and mighty prosperous motor merchants. Big as was the success of the AMERICAN in 1919, it is only a foretaste of the spectacular success that will follow in 1920, under the impetus of the existing large demand and the additional flow of business which our intensive national campaign will accelerate.

The "new" Smile Car is distinguished by something more than a touch of the novel here and there. It is something more fundamental than any mere touch that a new refinement could give it. It goes beneath the paint and under the body. It is rooted in its underlying construction.

And in developing this new design we have not lost those vital features of Balance which have made the AMERICAN known wherever it goes as the Smile Car. To best appreciate what the AMERICAN franchise means see this car at the shows.



AMERICAN MOTORS CORPORATION

Factory and Sales Offices: Plainfield, New Jersey

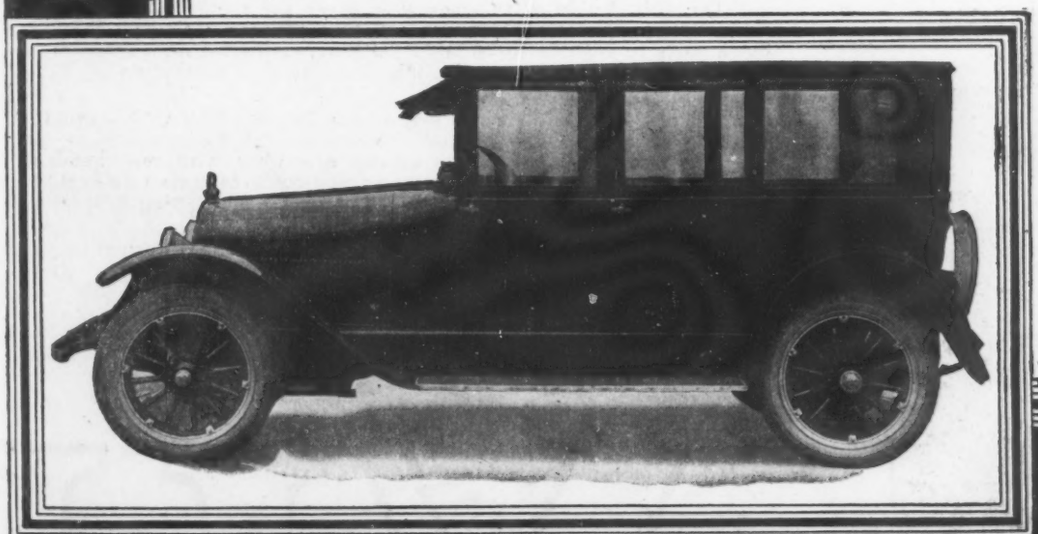
"American Six" to Build New Model of 1920

Rumors are about to the effect that the American Motors Corporation has something very interesting to disclose in the new Smile Car which has been in process of development at the company's Plainfield plant for some months. This model is said to be the personal achievement of Mr. Guy Morgan, who joined the American General Corporation as vice-president and manager last July.

"It is a fact," said P. W. Frank, vice-president and general manager of Franklin, quite readily up our sleeve," that we have something to let the secret out, "but we are not questioned, and "but supervisor of sales, when of our tests of the new car are so startling and the results of its unusual features or its chassis will be exhibited for the first time. details. However, it will all come out at the national automobile shows where the We are confident that this new model will more than justify the reputation for "Miles of Smiles" which our product has already won by its unequalled performance on the road."

It is understood that the new car will embody the fundamental features of construction that have led to the widespread success of the American Balanced Six, but it will also include some radical improvements in design. The exact character of these features has not yet been disclosed, but innovations known that they are distinct into production. The company plans to get when building operations now under way at its Plainfield plant will enable it to undertake a production of 500 cars per month. In order to provide for the rapidly growing demand for the company's product, which is particularly large in territory, it is also reported that arrangements have been concluded for the establishment of a separate assembling unit at a central point in the South.

Reprinted from the New York Sun



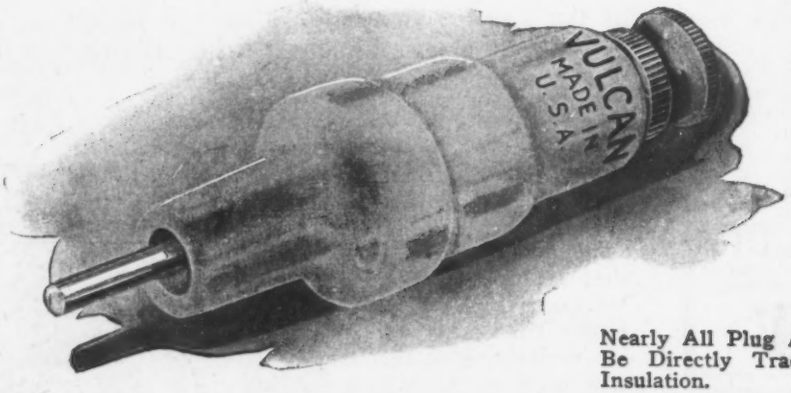
Six Cylinder Rutenber-American Motor

Westinghouse Starting and Lighting System.

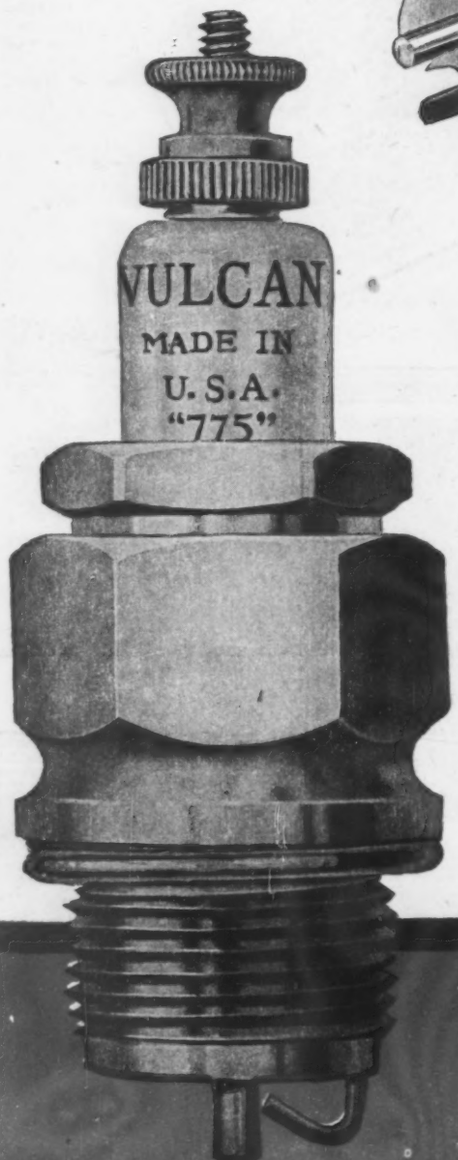
Atwater-Kent Ignition

The Balanced Six

Spark Plug Quality Begins in the Insulation



Nearly All Plug Annoyances Can Be Directly Traced to Inferior Insulation.



This 775 Porcelain is **specially designed** for the **VULCAN SPARK PLUG.**

Just notice the sturdiness of this extra large insulation.

It is **heavy** and strong, not only in the middle where the greatest heat is generated but graduated in thickness to the very end, forming a non-conducting "petticoat" of the very finest insulation which extends deep into the firing chamber and secures absolute combustion of every bit of gas.

The very design of this porcelain gives the motorist extraordinary protection against that common evil, compression leakage. With no extra parts to wear off or suffer from long, continued high temperature and pressure, short circuiting, pre-ignition and the formation of carbon are positively prevented.

There is only one way to sell a plug like the VULCAN—and that is to **know all about it.** In this advertisement we are offering you only the obvious selling points of this new plug, with the confidence that your better judgment will prompt you to investigate this quality—though reasonably priced—plug before you make spark plug connections for the coming season.

Subsequent advertisements will give you additional information with complete details.

Retails at $1.00 in all sizes.

VU

SPA

Back of every VULCAN PLUG *This Guarantee*

From 700 to 1,000 degrees, F, of heat are generated in the automobile gas engine.

The Vulcan Plug is tested and will stand fully 1,600 Degrees, F., of heat. Only a plug with a sturdy insulation can stand up under such terrific pressure.

The functions of the center electrode are almost as important as the insulation. The VULCAN electrode is made of chrome, nickel and platinum. Extending deep into the firing chamber it gives the motorist a constant lively ignition and eliminates fusing and corroding.

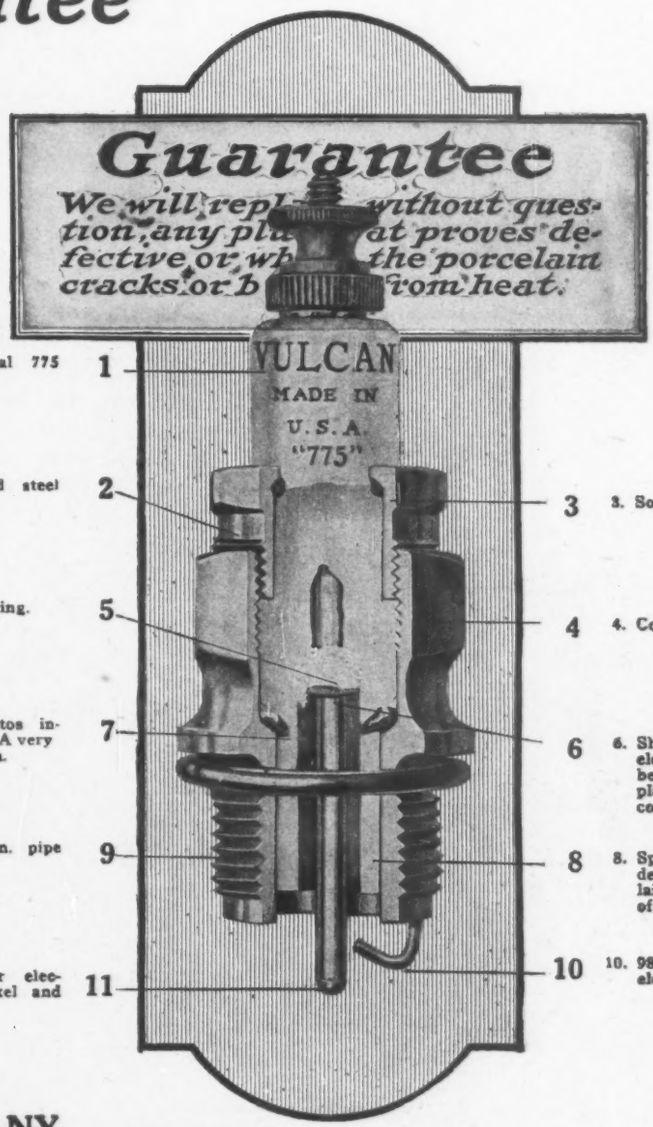
With a heavy, long, "petticoat" of 775 insulation the VULCAN prevents carbon formation because it separates the oil from the gas, forcing it around the outer circumference where the heat vaporizes it, permitting only an explosion of dry gas, thereby increasing the strength of each explosion.

By using the best 775 Porcelain, specially designed, and only the highest quality metal in our casing, we are able to guarantee the VULCAN and stand behind you on every sale.

Vulcan Plugs are now ready for prompt shipment.

Made in ½" and ⅞" A.L.A.M., Metric size and ⅞" A.L.A.M. Extension.

Write or wire for jobbers' and dealers' list and details.



1. Vulcan Special 775 Porcelain.
2. Cold rolled steel bushing.
3. Solid copper gasket.
4. Cold rolled steel.
5. Asbestos packing.
6. Shoulder on center electrode holding asbestos packing in place and preventing compression leakage.
7. Copper asbestos inverted gasket. A very successful idea.
8. Special "petticoat" design keeps porcelain insulation free of carbon.
9. Standard ⅛-in. pipe thread.
10. 98½ nickel ground electrode.
11. Heavy center electrode of nickel and platinum.

VULCAN IGNITION COMPANY

New York City :: 25 Church St.

Don't fail to meet us at the Kansas City Show, at Booth No. 20, in the Accessory Department.

VULCAN

RK PLUG



MAC~LAR

The Spectacular Spike Test

MAC-LAR is a battery of unusual strength and endurance.

Prove this to yourself. The spectacular Spike-Test, easily demonstrated by you, right in your place of business, will visualize for you and for your customers the mighty strength and unequalled endurance of this Master Battery.

Short circuit the Mac-Lar Master Battery by means of two 20-penny spikes held to its terminals.

In a fraction of a minute, the tough steel of the spikes will be fused—white hot drops of steel will drop from the spike points onto the floor.

Repeat this test time and time again, discharging the battery completely—recharging and discharging—over and over again. When you have finished this abuse, the Mac-Lar plates will remain unblemished—sound, hard and flawless.

The current required to fuse these spikes is greater than that required to start any automobile motor in use today.

Just think what effect this tremendous discharge of current has on a motor these cold mornings.

Add to Mac-Lar's super-discharge ability—its unusual recharge efficiency—and this hard-plate Master Battery will give you a new understanding of battery performance.

Think What This Means to You

Mac-Lar is guaranteed in writing for 18 months—it has lasting strength. Add to this the fact that four standard Mac-Lar types fill the requirements of 99 out of 100 of the electrically equipped automobiles in use today, replacing more than 51 combinations and shapes of other batteries, and you will understand why the Mac-Lar Agency is wanted the country over by men of big ability and big desires.

Your territory may still be open. The Mac-Lar Agency proposition will appeal to you. Write or wire for it.

MAC-LAR BATTERY COMPANY, Inc.
DETROIT, U. S. A.

MASTER STORAGE Batteries



TEMPTROL

Rapidly "Warms Up" the Coldest Motor—On The Coldest Winter Day

TEMPTROL, the positive hand operated dash temperature control, makes the biggest sort of a hit with your customers because it's a **personal** time and trouble saver

With TEMPTROL installed—they don't have to wait to "heat her up" or drive "bucking" down the street for blocks with a cold, sputtering motor eating up raw gas and banging at the main bearings.

TEMPTROL ends these real objections to winter driving—saves gas and oil, and wear and tear on motor, starter and battery.

TEMPTROL traps the water in the water jacket, which quickly heats and holds the motor to efficient operating temperature. Then when under way, with the motor running perfectly, the remaining water supply is gradually brought to the most efficient temperature.

TEMPTROL makes it possible to **maintain** the most efficient motor operating temperature at all times, regardless of varying weather—giving economical summer carburetion all year 'round. And when the motor is stopped TEMPTROL conserves the heat around it.

$7.50

Easy to Install

JOHNSON CO.

DEALERS - You Can Make Big Money This Winter Selling TEMPTROLS to Car Owners In Your Territory

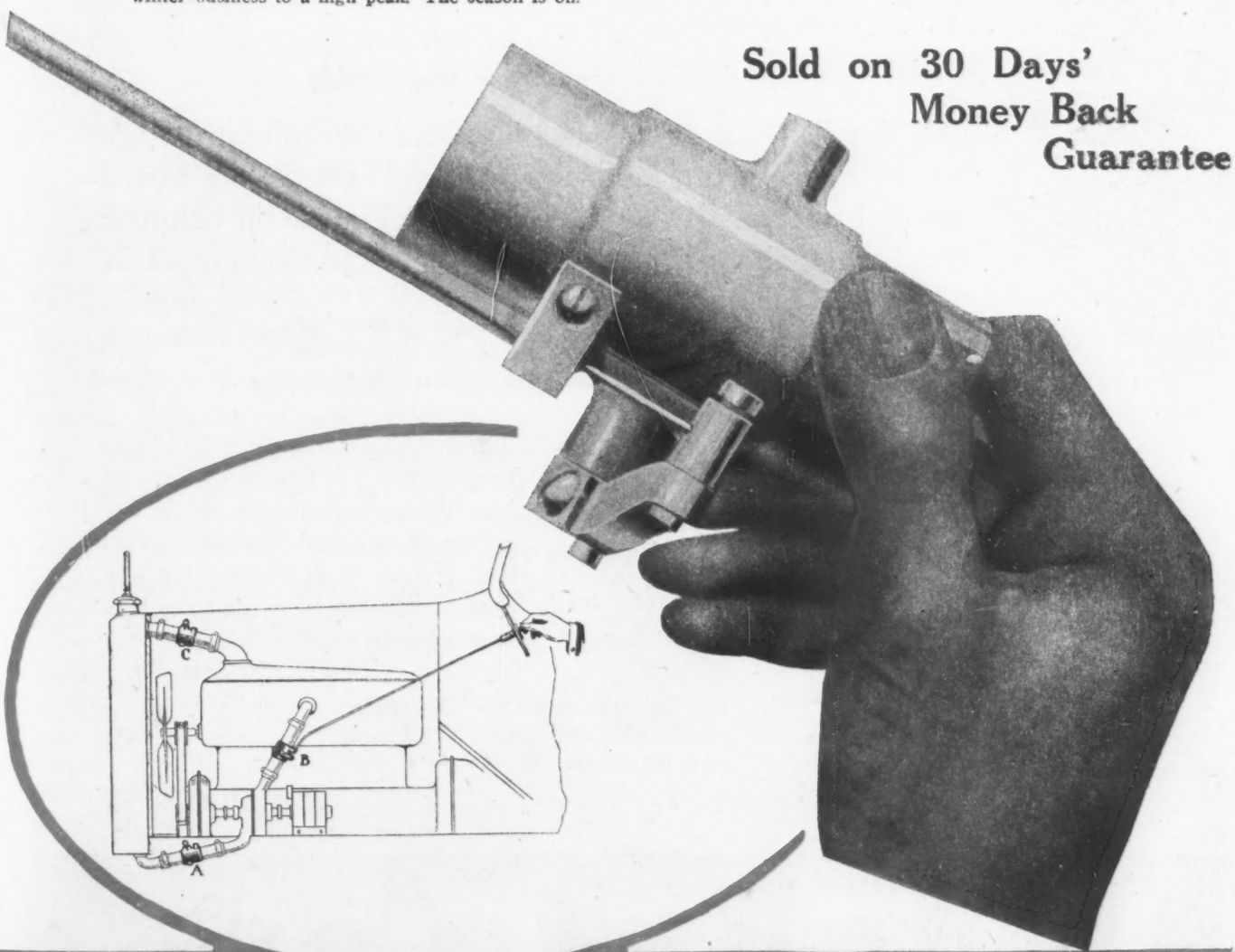
TEMPTROL is new and necessary to every car, truck and tractor. It sells easily because it renders a service that owners readily recognize and duly appreciate. And it makes friends fast.

TEMPTROL offers unusual sales and profit possibilities. It costs little and is manufactured and guaranteed by a concern well known to the industry and trade. Every owner knows the need of a positive control on the water circulation system, and the 30 day's money-back trial on which TEMPTROL is sold proves that TEMPTROL meets this need.

It is the only device of its kind on the market.

Write or wire for full particulars, and a demonstrator for your own car. Make TEMPTROL help pull your winter business to a high peak. The season is on.

Sold on 30 Days' Money Back Guarantee



Detroit, Michigan

The Steatite Insulator

No extremes of heat and cold can break this insulator. It is proof against electrostatic puncture. It will stand against physical shocks that would shatter the porcelain in plugs you now sell.

This is a blunt plain statement of fact—a long proved claim, standing alone in the whole field of spark plug manufacturing endeavor.

And now note the electrode design

The needle point central member sheds the slightest particle of oil before it can reach the spark gap—the double curved ground electrode is also designed to reject the oil before it reaches a point where sparking heat could decompose it.

Carbon formation is therefore impossible and so the Liberty Spark Plug needs no cleaning—it takes care of that job itself.

With the unbreakable Steatite Insulator no short circuit is possible—the electrode arrangement prohibits carbon—the simple but correctly designed parts assembly guarantees against compression leak.

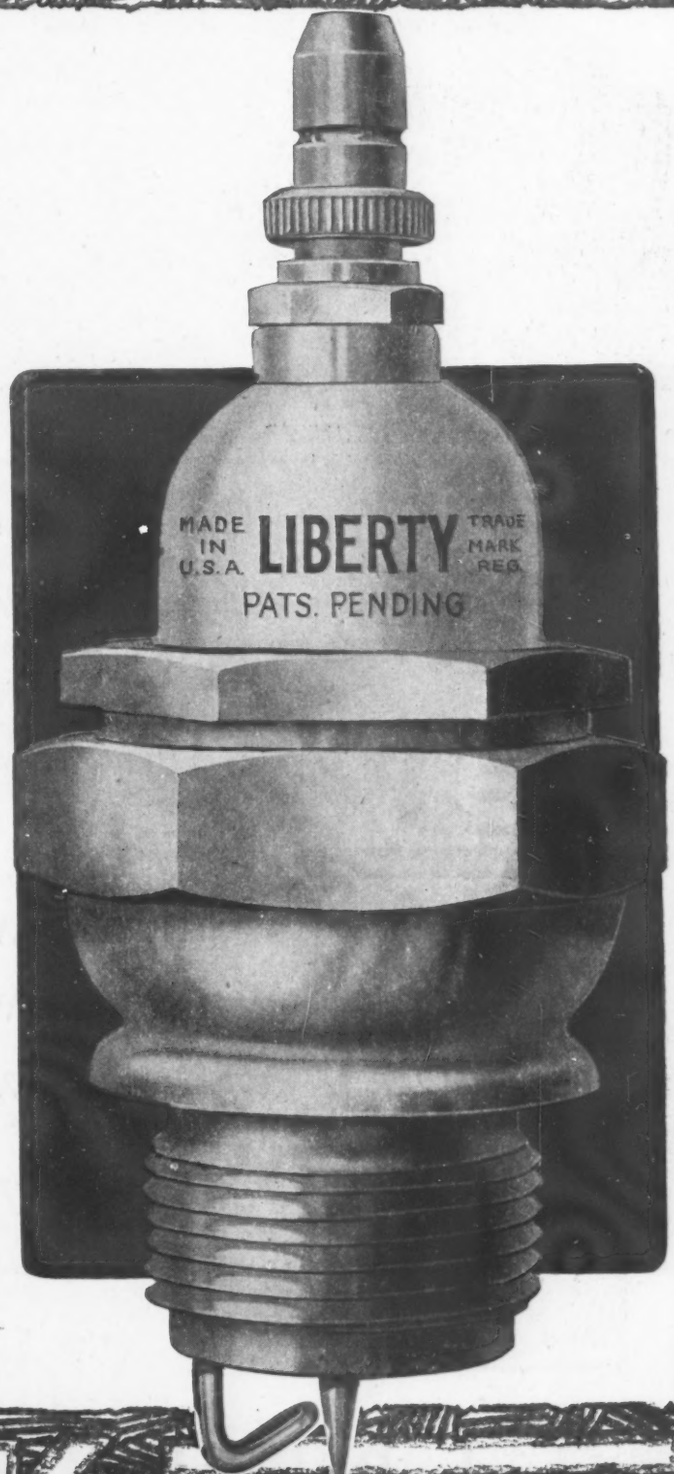
The Liberty Spark Plug is a business maker. It will work on and on to the lasting satisfaction of every car, truck or tractor owner who selects it as a replacement. It is a plug of distinction made to sell to super-critical buyers.

The list price is $1.50—Our trade propositions will appeal to jobbers and dealers—Write or wire.

LIBERTY

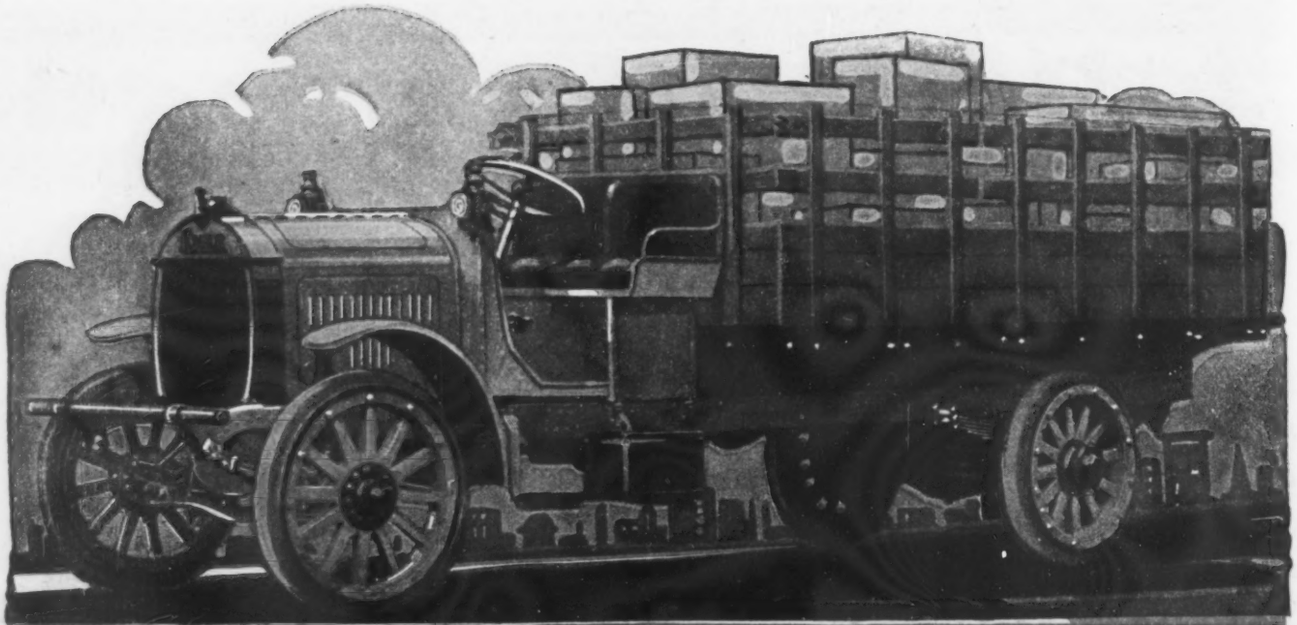
A Dome of Strength

DEALERS—*Aside from the service The Liberty Spark Plug guarantees its users, you will find that its very appearance holds a strong appeal. Sturdy and oversized, it "looks" all of the built-in qualities it possesses. The heavy shell is of brass, burnished into a glistening golden surface. The solid Steatite Insulator Dome, topped by the brass connection, completes a design of substantial beauty. It is indeed the aristocrat among plugs. Liberty Spark Plugs will sell themselves right out of your show case.*



The Federal Corporation
100 North Elm St.
Westfield, Mass.

SPARK PLUG



KOEHLER

REG. TRADE MARK

TRUCKS and ROAD TRACTORS

NEW

—in the way they are built
—in the way they perform
—in the way they sell

THE KOEHLER LINE

Model "C,"
1¾ ton truck chassis,
$1885

Model "M,"
2½ ton truck chassis,
$3165

Model "MT,"
5 ton road tractor chassis,
$3250

Write for Details and Our Unusually Attractive Dealer Proposition

H. J. Koehler Motors Corp.
158 Ogden St. Newark, N. J.

MARLIN-ROCKWELL INDUSTRIES



The Mark on the Bearing

THE mark on the bearing tells its history—the history of its making and past record and thereby in advance the history of its future performance. When that mark is the S. R. B. Diamond, it means the finality of bearing quality, frictionless operation, dependability, demonstrated in service from the beginning of the automotive industry.

SRB

Single Row Double Row

ANNULAR BALL BEARINGS

Bearings do their work—in the automobile, truck, tractor or other mechanism—hidden away from sight. All the more credit to the manufacturer who installs bearings of S. R. B. quality—all the more reason why you should know the make of bearings in the vehicle or machinery you buy.

From the melting, rolling and annealing in our own steel plant of the High Chrome High Carbon Electric Furnace Steel that is the foundation of S. R. B. strength to the last ten-thousandth inch of accuracy of finish, S. R. B. Bearings are the product of the same organization working to one ideal.

You will find S. R. B. Ball Bearings and S. R. B. Taper Roller Bearings in those motor cars, trucks and tractors whose names are instantly thought of as leaders in their respective fields.

STANDARD STEEL AND BEARINGS INCORPORATED

Philadelphia Standard Roller Bearing Co. Plainville, Conn. Norwich Conn. New Haven, Conn. Pittsburgh Braeburn Steel Co.

Executive Offices: 347 MADISON AVENUE, NEW YORK CITY

Controlled and Operated by

MARLIN-ROCKWELL CORPORATION

AUBURN Beauty SIX

AUBURN Beauty-SIX

TWENTY years of solid success have established a nation-wide prestige for the Auburn Automobile Company.

The leadership accorded this pioneer organization is reflected in the community-standing of every Auburn dealer.

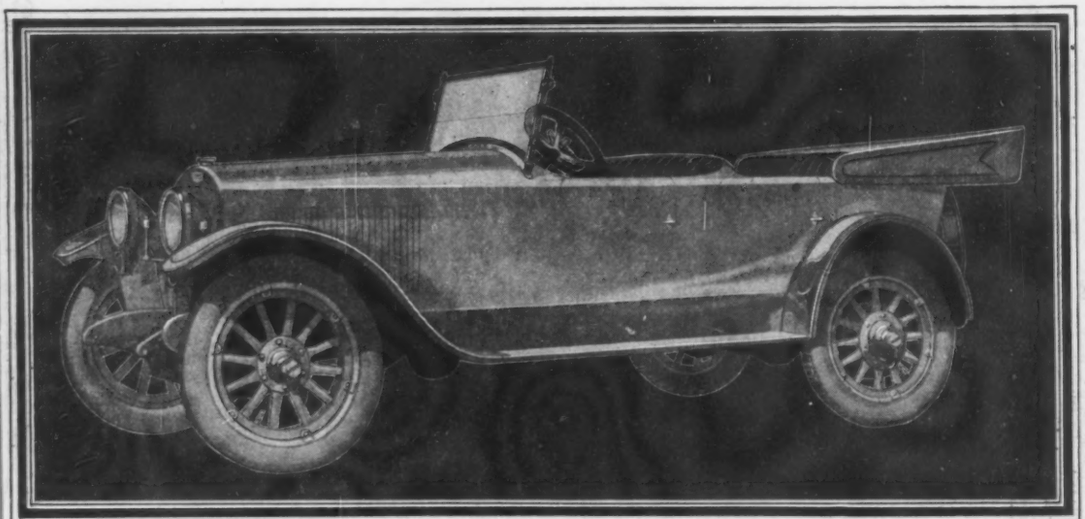
The AUBURN Beauty-Six represents the industry's most notable advances. In its design, supreme beauty and brute power are skillfully blended by the master-hand of experience.

AUBURN AUTOMOBILE COMPANY, AUBURN, INDIANA

Automobile Engineers for Twenty Years

5-Passenger Touring Car . $1795 5-Passenger Sedan . . . $2775
4-Passenger Tourster . . $1795 4-Passenger Coupe . . $2775
2-Passenger Roadster . . $1845

(*F. O. B. Auburn, Indiana*)



"Built By Cord Tire Specialists"

Count the Cords at the Shows!

NOTICE the cars displayed at the automobile shows this year and the percentage having cord tires as original equipment.

The predominant feature of the tire industry today is the great demand for cord tires. Car manufacturers realize that cord tires cushion the mechanism of the motor and preserve the life and newness of the entire car. Car owners who once use cords are satisfied with nothing else.

Realizing this, a group of cord tire specialists from some of America's largest tire companies are building SYRA-CORD TIRES in a factory where the only tires made are cord tires. By specialized production, improved processes and best quality materials, they have placed SYRA-CORDS at the peak of cord tire development.

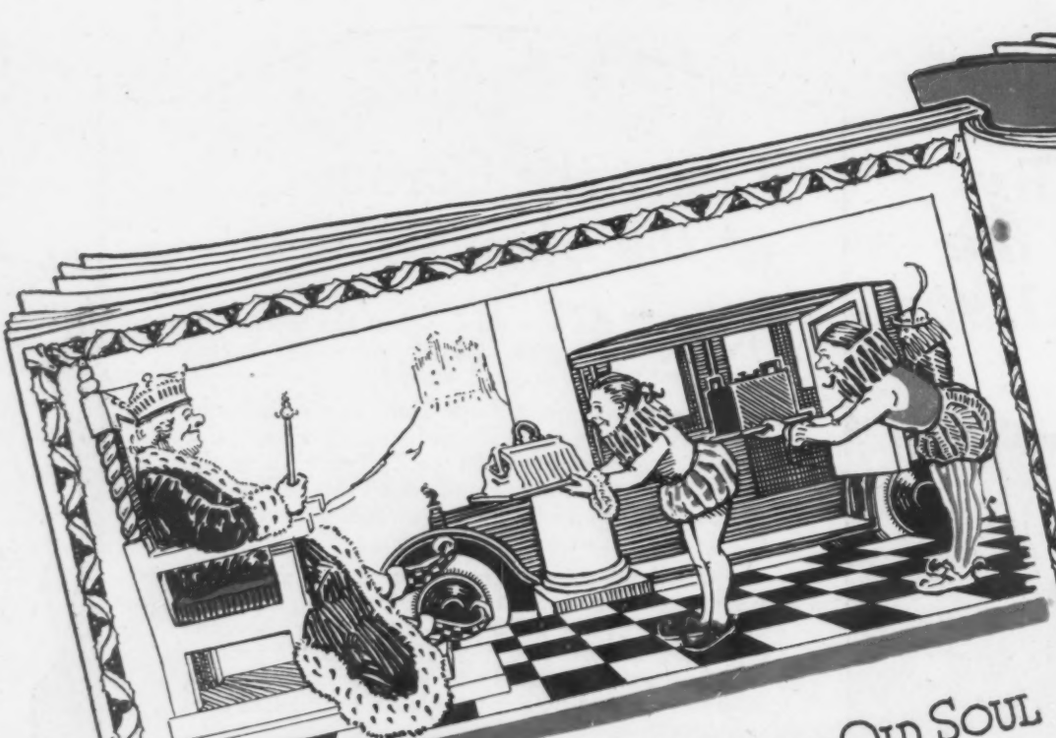
SYRA-CORD service and the economy of the SYRA-CORD universal tread will surprise you.

Some dealer territory still open. Better wire today!

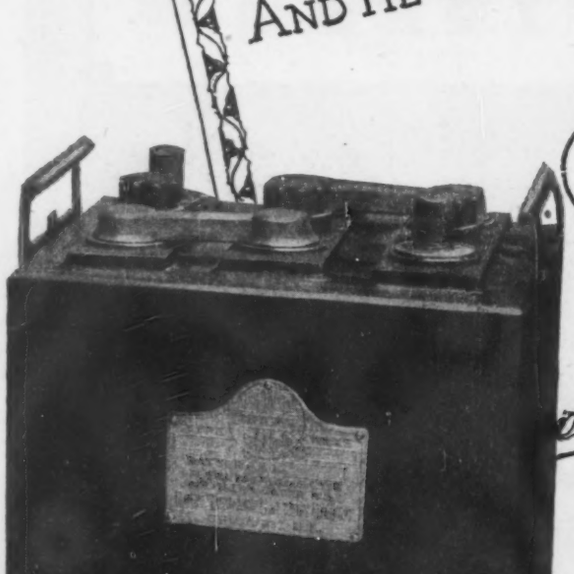
SYRACUSE RUBBER COMPANY, *Inc.*
SYRACUSE, NEW YORK

Syra-Cord TIRES





OLD KING COLE WAS A MERRY OLD SOUL
A WISE MOTORIST WAS HE
WHEN HE WENT ON A TRIP
HE CALLED FOR HIS GRIP
AND HE CALLED FOR HIS COLE BAT-TERY



COLE BATTERIES

QUALITY TRADE MARK SERVICE

COLE STORAGE BATTERY CO.
2439 Indiana Ave., CHICAGO, U. S. A.

The Hand-Made Truck

"KALAMAZOO"

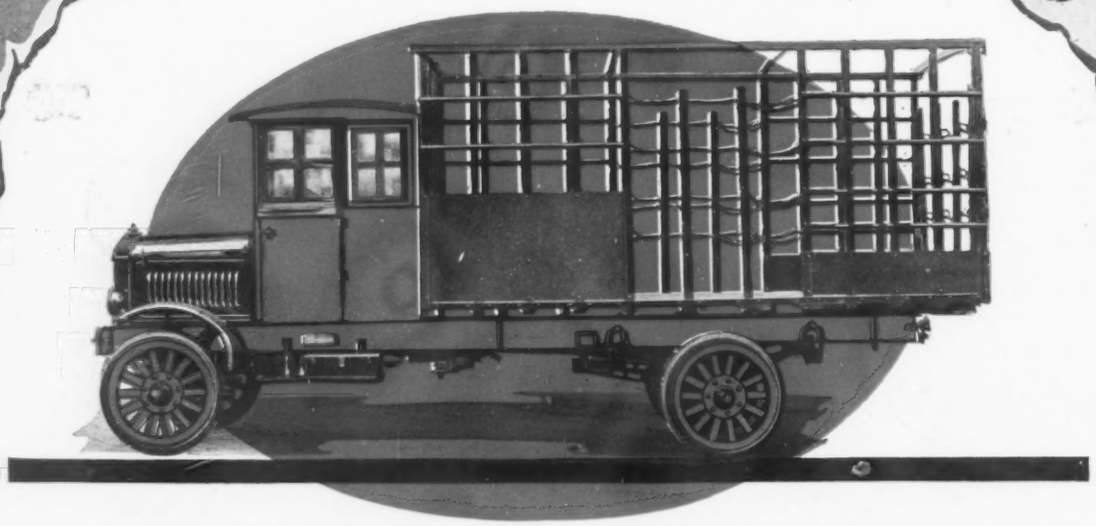


New Models Coming Through!

Ship by Truck

Kalamazoo Motors Corporation
Motor Truck Division
Kalamazoo, Michigan U. S. A.

1½ 2½ 3½ Tons



"KALAMAZOO"
The Hand-Made Truck

We Take No Chances

EVERY UNIT MUST HAVE PROVED ITS WORTH BEFORE WE ADOPT IT; WE STAND ON OUR THREE YEAR RECORD

Words are more or less idle—*The Truck's the Thing.* Your reputation, hence your business success *depends* upon the dependability of the ***product you handle.*** For that reason, if for no other, it will pay you to investigate the "Kalamazoo". For quick action, desirable territory still open.

GENERAL SPECIFICATIONS

MOTOR: 4 cylinder; pressure lubrication to all bearings.

CLUTCH: Dry disc steel with Raybestos lining.

TRANSMISSION: 4 speeds forward and reverse.

AXLE: Worm drive (David Brown type) semi floating.

WHEELS: Steel.

UNIVERSAL JOINTS: Oiltite.

DRIVE: Left hand; center control.

LUBRICATION: Alemite system.

RADIATOR: Tubular core; 5-piece assembly.

STEERING GEAR: Split nut type, semi-reversible.

STARTING and LIGHTING: Two-unit 12 volt system.

RADIUS RODS: I-beam bridge construction bronze bushed.

FRAME: 22-point carbon rolled steel, oversize on all models.

SPRINGS: Electro silicon manganese master leaf; bronzed bushed eyes.

CAB: Three-man Coppock universal enclosed type, all steel construction.

EXTRA EQUIPMENT: Radiator guard, towing hooks front and rear, tool kit, Boyce motometer, jack, pump, etc.

The Most Completely Equipped Motor Truck in America

First Showing of New Models at Chicago Show

SPACE C-5—MAIN FLOOR

INTERNATIONAL AMPHITHEATRE

Ship by Truck

1½ 2½ 3½ Tons



"Big Business" Buys UNITED Spark Plugs

Owners of big truck fleets buy United Spark Plugs because they survive the hard work and abuse of truck service.

United Spark Plugs provide consistent ignition day in and day out—they serve. And truck owners want the "Lockt" terminal —for it gives a positive contact that no truck vibration can loosen.

There are many repeat orders of United Spark Plugs—"Big Business" buys them again and again.

United Spark Plugs are guaranteed—and you make a liberal profit on each sale.

Heavy Duty, $1.00 for Trucks and Tractors **RETAIL PRICE** **Junior Type, 75c** for Passenger Cars

Look in the Chilton Automobile Directory and Auto Trade Directory for list of jobbers handling United Spark Plugs.

Ask Your Jobber for the Plug in the Yellow Checkerboard Box

UNITED

Made for a Purpose— Consistent Ignition

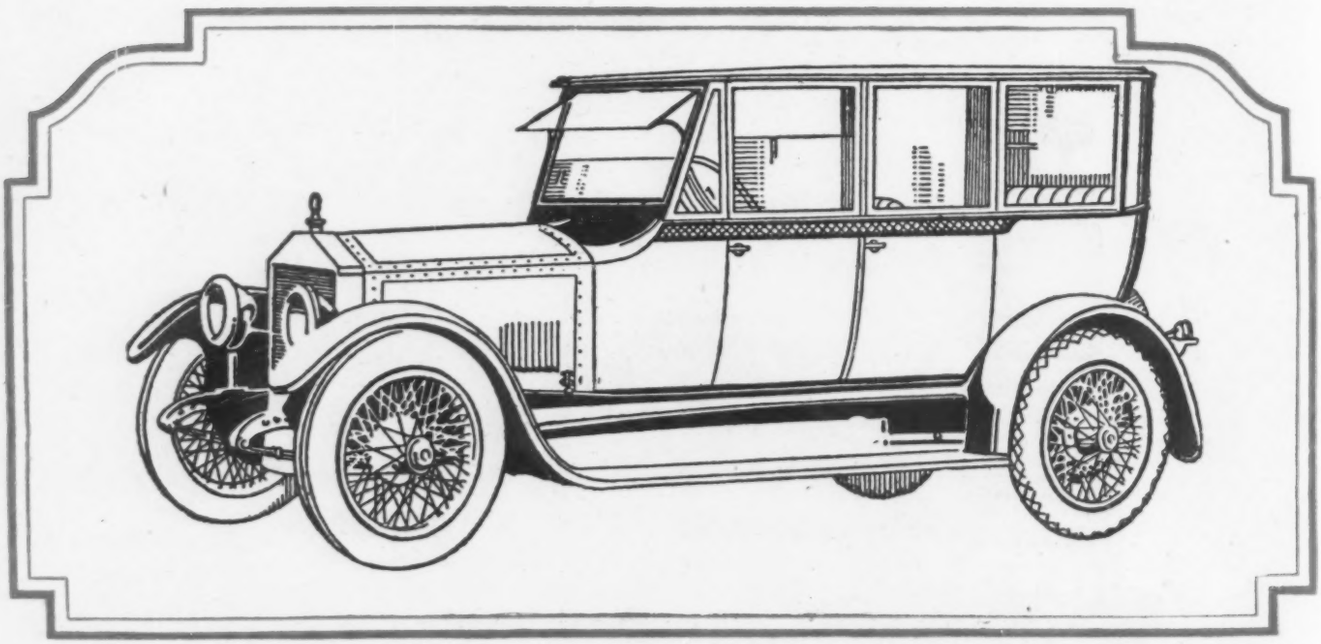
United Manufacturing and Distributing Co.

LAKE SHORE DRIVE AND OHIO STREET, CHICAGO, ILLINOIS

Pacific Coast Representative
A. C. RIDDELL
Marvin Bldg., San Francisco, Calif.
Higgins Bldg., Los Angeles, Calif.

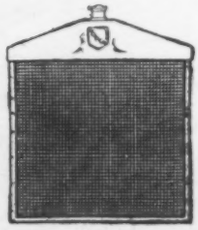
Southern Representative
BLOCK AUTOMOTIVE CO.
Charlotte, North Carolina

UNITED SPARK PLUGS



THIS year the ROAMER exhibit is even more distinguished than in seasons past. The originations of ROAMER designs have been supplemented by the creative coachwork of such noted builders as Rubay, et al.

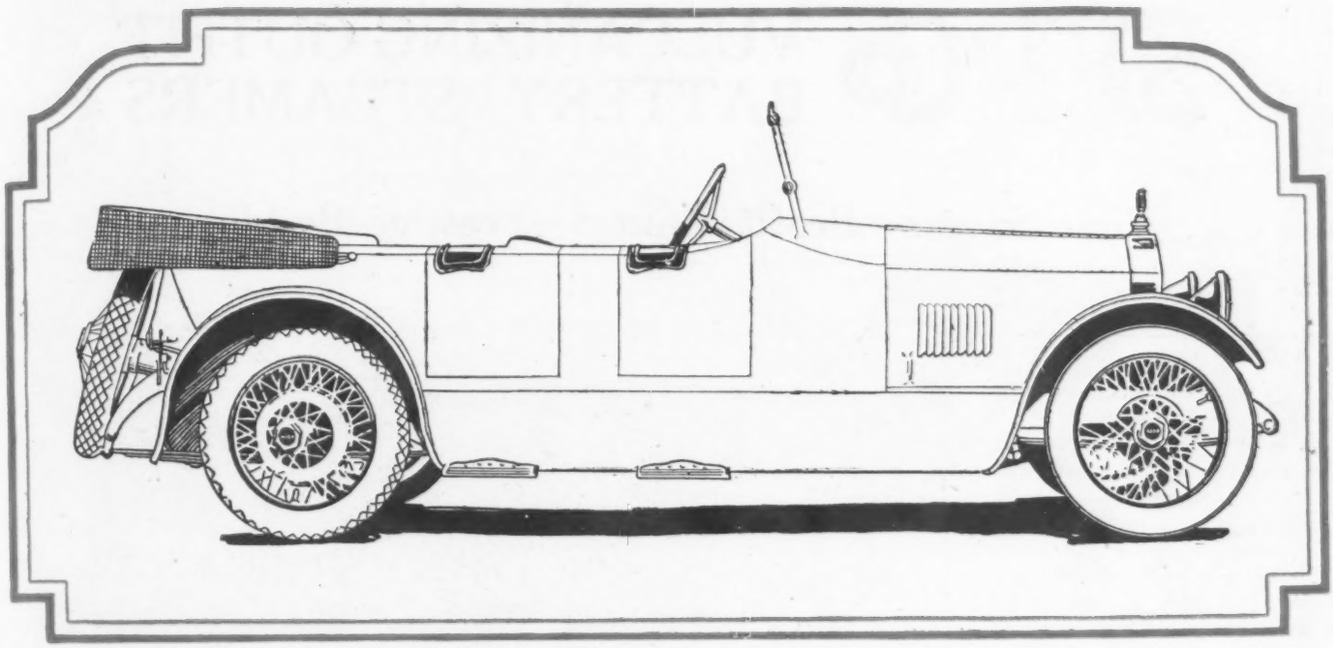
Seven models of enduring smartness now embody the ROAMER idea. From this assembly of distinctive ROAMER models we have selected the most notable for these exhibits to which you are cordially invited.



BARLEY MOTOR CAR CO., *Kalamazoo, Mich.*

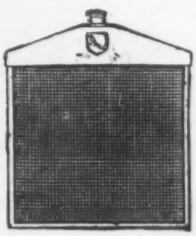
The ROAMER

America's Smartest Car



THERE is always a particular zest in visiting the ROAMER exhibits at the National Automobile shows. You realize, in advance, that the newest notes—the latest tendencies—in motor car design and construction will greet you.

Then, too, it is a relief to come upon a motor car so wholly different after encountering a long procession of the ordinary. It is like clasping hands with a dominant personality after a prolonged session with mediocrities.



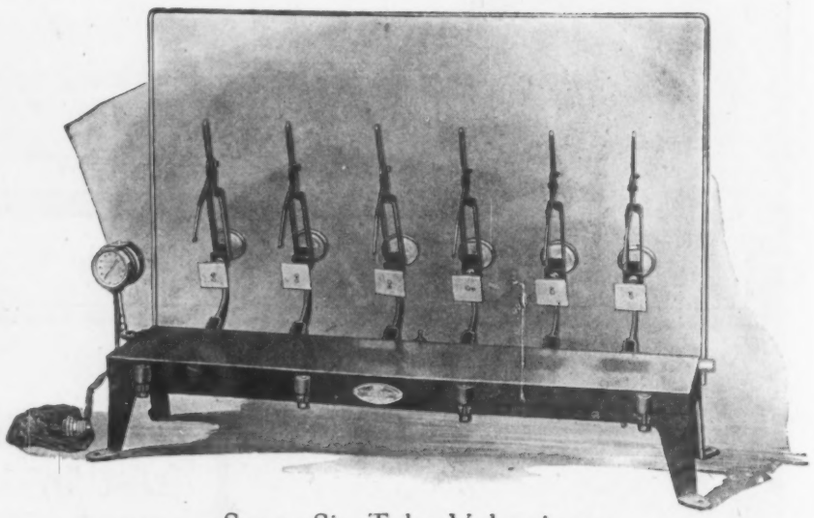
The ROAMER

America's Smartest Car

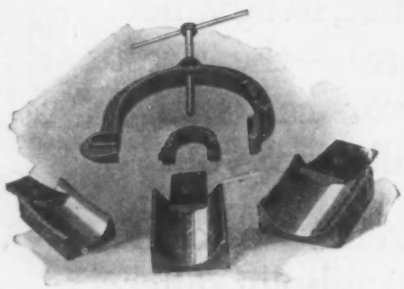
SEPCO VULCANIZING OUTFIT BATTERY STEAMERS

Time Savers—Profit Makers—Prestige Builders

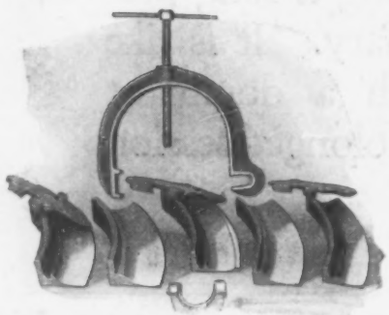
SEPCO appliances save time and labor and eliminate the risk of spoiled work. The SEPCO Vulcanizer is the handiest, safest tube patch and tread repair vulcanizer made today. Temperature is automatically controlled and cannot vary more than two or three degrees. Requires no watching and gives absolutely uniform results. No dangerous boiler, no gas or gasoline used. Heat generated by electricity. Costs nothing for fuel when not in use. Curing temperature is reached in ten minutes after current is turned on.



Sepco Six Tube Vulcanizer



SEPCO TREAD MOLDS



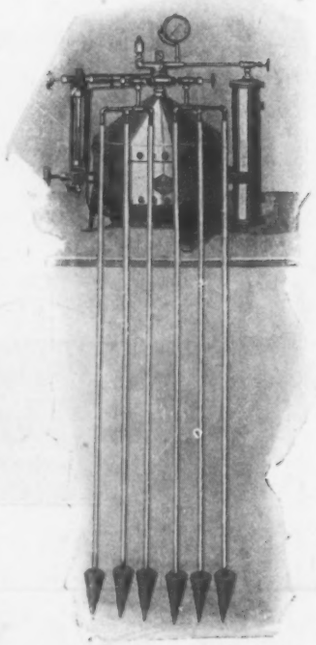
SEPCO SIDEWALL MOLDS

Tread and Sidewall Molds for the SEPCO Tube Vulcanizer make it a complete outfit.

The SEPCO Tube Plate shown above may be purchased by itself or as a complete outfit, including Tread and Sidewall Molds. It is absolutely safe and can be installed anywhere without breaking fire ordinances. Write for complete information.

Sepco Battery Steamer

With the SEPCO Steamer you can soften the top and open a six cell storage battery in ten minutes. It uses live steam under pressure, but pressure is automatically controlled well within the safety point. Saves half an hour to an hour's time on each battery. You can open and inspect battery while customer waits, if desired. Note also the still which will give you three quarts of chemically pure distilled water in an hour. Endorsed by all battery makers. Write for circular.



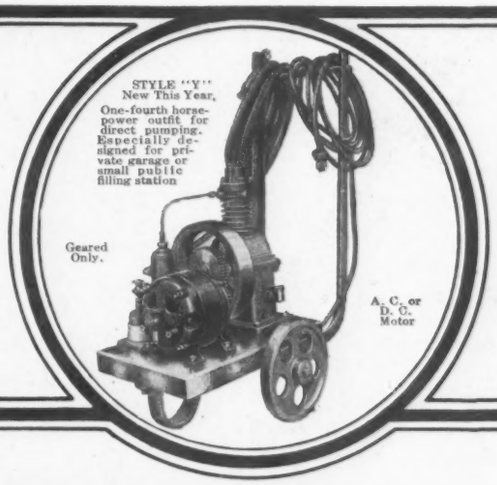
Sepco Battery Steamer

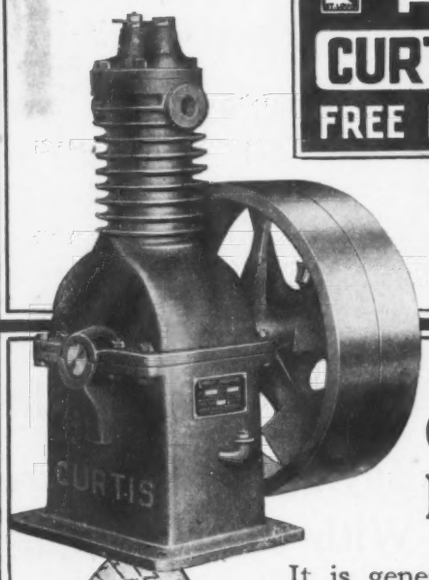
THE GLOBE MACHINE & STAMPING CO. SEPCO DIVISION

1250 West 76th St. **CLEVELAND**

FREE
CURTIS AIR
FREE FROM OIL

The Curtis Sign is 10x14 inches—baked enamel on steel. Furnished FREE with every Curtis Garage Air Compressor—can not be had in any other way.



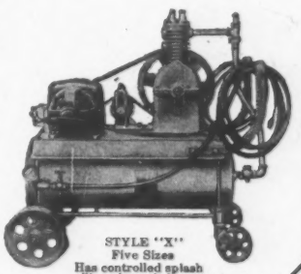


Curtis Free Air Service Brings You New Patrons and Increased Profits

It is generally recognized that compressed air to fill tires frequently carries oil and that this oil has a deteriorating effect on inner tubes. For this reason motorists are discriminating in their use of "free air service"—and are on the lookout for the Curtis sign because they know that Curtis Air is free from oil. It may be that the installation of the CURTIS outfit will be the beginning of a new era of profit-making for you.

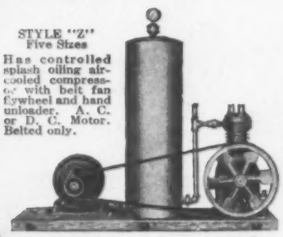
Curtis Air—Free From Oil

Curtis Air Compressors, through a patented construction, prevent oil from getting into the air line—therefore the air delivered is clean, pure and free from oil. The many other exclusive points of superiority, together with the simplicity, sturdiness and dependability of Curtis Compressors make them the popular choice everywhere. With the two new outfits illustrated—Style "Y" and Style "V"—the Curtis line is now complete, offering a suitable compressor to meet every requirement. Ask your jobber or write us for illustrated literature describing the different sizes and types of outfits.

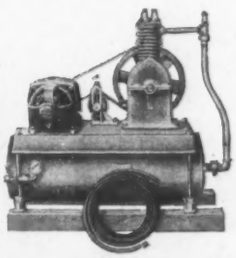


STYLE "X"
Five Sizes
Has controlled splash oiling air-cooled compressor, with belt fan flywheel or with cut flywheel gear. A. C. or D. C. motor. Belted or geared.

CURTIS PNEUMATIC MACHINERY CO.
1546 Kienlen Avenue St. Louis, Missouri
Branch Office: 531-B Hudson Terminal, New York City



STYLE "Z"
Five Sizes
Has controlled splash oiling air-cooled compressor with belt fan flywheel and hand unloader. A. C. or D. C. Motor. Belted only.

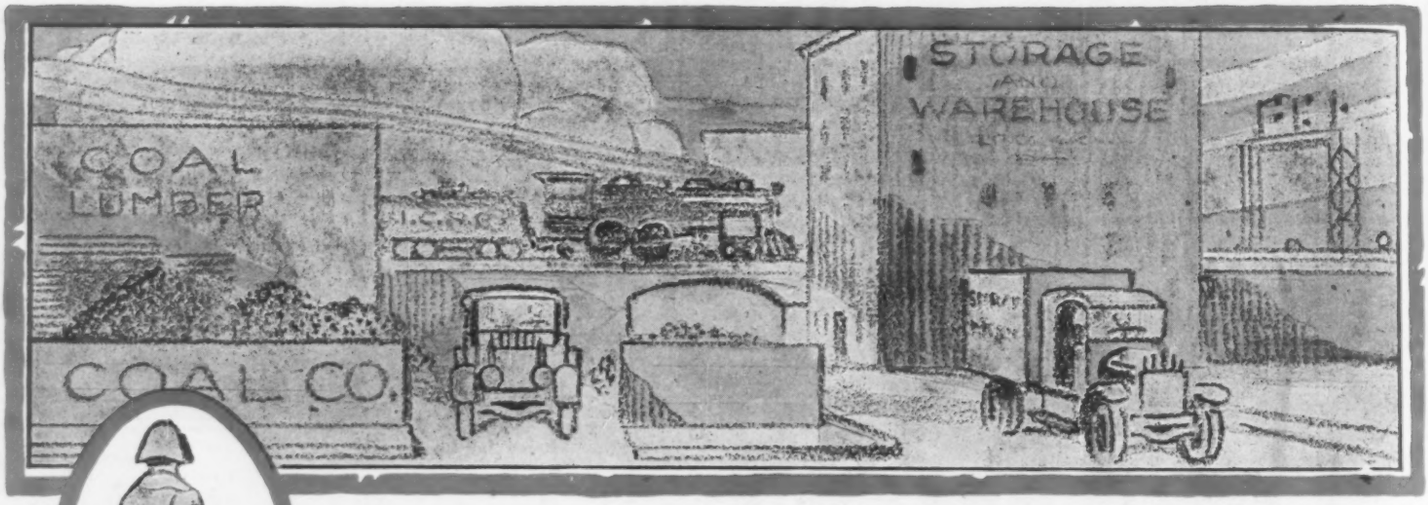


STYLE "V"
New This Year
Five Sizes
Has controlled splash oiling air-cooled compressor, with belt fan flywheel or with cut flywheel gear. A. C. or D. C. motor. Belted or geared.

Curtis Pneumatic Machinery Co.
1546 Kienlen Ave.
St. Louis, Mo.

Gentlemen:
Please send me full details on Curtis Air Compressors — your proposition and prices.

Name_____
Address_____
Jobber's Name_____
Address_____



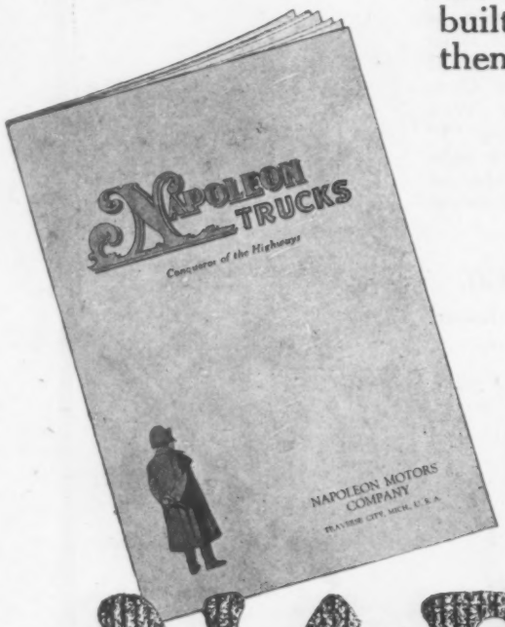


1-Ton Chassis
Solid Tire Equipped
$1385

Pneumatic Tire Equipped
$1550

90% of the Buying Public Are Familiar With the Nationally Known Parts in Napoleon Trucks

This indicates one big reason why Napoleon dealers are prosperous—why they find little sales resistance ahead of Napoleon Trucks. Prospects for Napoleon Trucks know what they are buying. They have confidence in Napoleon parts and units. They know a truck designed and built the way Napoleon Trucks are designed and built will be an economical, reliable hauling unit for them.



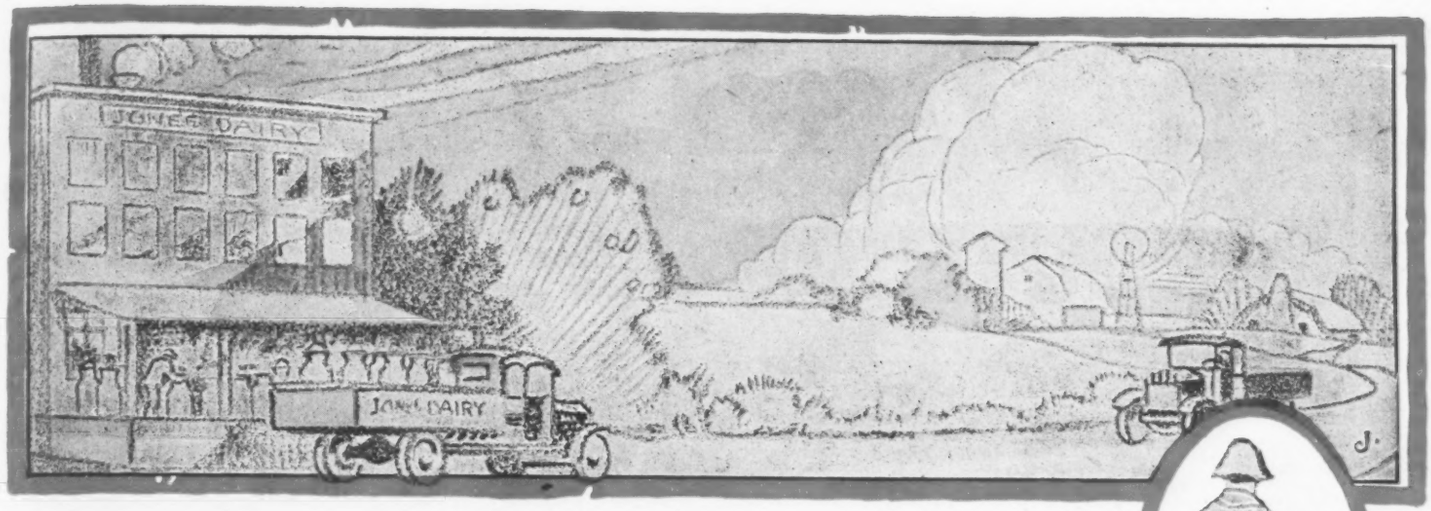
Napoleon dealers find that just as soon as a prospective truck buyer becomes thoroughly familiar with Napoleon construction, the sale is made. As far as buyers are concerned, to know Napoleon Trucks is to want them.

NAPOLEON

Traverse City,

NAPOLEON

CONQUEROR OF THE HIGHWAYS





A glance at some of the more important Napoleon features is pretty good proof of Napoleon reliability — the highly developed valve-in-head motor, producing an abundance of power under all conditions—Clark internal gear drive axle—Fuller Transmission and Clutch—Connecticut ignition—Willard Storage Battery—electric Auto-Lite generator—Napoleon double reinforced frame —Chicago (army type) radiator swinging on vanadium steel cantilever springs—electric head and tail lights.

These and many other up-to-the-minute improvements are good indications of Napoleon superiority.

Your territory may be open for high grade, aggressive representation. Wire or write for our proposition.

1½-Ton Chassis
Solid Tire Equipped
$1660

Pneumatic Tire Equipped
$1860

MOTORS CO.

Michigan

TRUCKS

CONQUEROR OF THE HIGHWAYS

"I'm the Tractor Competition In My Town"

That's what any Avery Dealer can say when he takes on the Complete Avery Line for 1920. It's the best dealers' contract ever offered, for it gives you the sale of not only a complete line of tractors, but also a complete line of tractor-drawn machinery and tractor belt-driven machinery to go with them.

The Avery Line for 1920 includes everything you need in building up a complete motor farming, threshing and road building machinery business in your community.

The Avery Line means *real opportunity* and *money* to *you* as a dealer. If you are going to sell tractors—sell a *complete* line. Be the motor farming specialist in your territory. Sell your customer exactly the size tractor that he needs. Then sell him *everything* he needs in the way of motor farming equipment.

When you sell a farmer a tractor, you know that, sooner or later, someone is going to sell him a thresher, a silo filler, some tractor-drawn implements or other machinery for use with his tractor.

Then why not get this business for yourself? Why develop this business for someone else? You can get it *all* with the Avery Line. The Avery Line gives you something to sell every month in the year. It makes *every* month an *Avery* month for *Avery Dealers*.

In addition you can centralize your buying; take advantage of your business volume in quantity discounts; insure prompt, dependable service to your customers, and sell machines that you can depend upon to operate satisfactorily when hitched together.

There's a *real business* opportunity for someone with the Avery Line in your territory, if it is still open. We are now making agency contracts for 1920. Don't wait till someone else makes you wish you had the Avery Contract.

Write us at once, or wire our nearest branch house.

AVERY COMPANY, Peoria, Illinois

Branch Houses: Madison, Fargo, Omaha, Minneapolis, Grand Forks, Sioux Falls, Aberdeen, Billings, Lincoln, Sidney, Davenport, Waterloo, Des Moines, Indianapolis, Columbus, Kansas City, Wichita, Stuttgart.

Jobbers: Avery Company of Texas; Dallas, Amarillo and Beaumont, Texas

Also Other Principal Machinery Centers

AVERY

Motor Farming, Threshing and Road Building Machinery



18-36 H. P. Avery Tractor

14-28 H. P. Avery Tractor

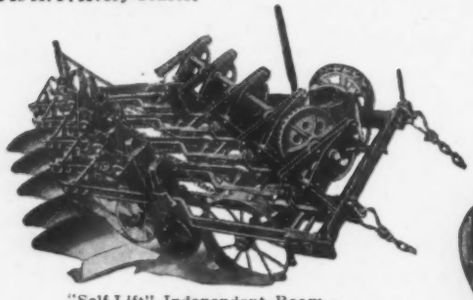
12-25 H. P. Avery Tractor

8-16 H. P. Avery Tractor

Avery Two-Row "Power-Lift" Lister



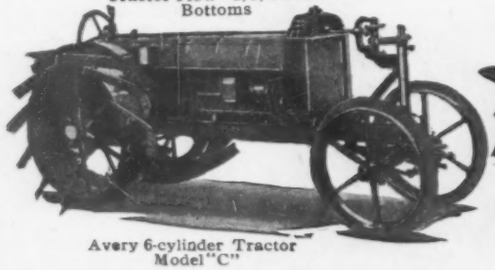
"Power-Lift" Rigid Beam Light Tractor Plow—2, 3, 4 and 5 Bottoms



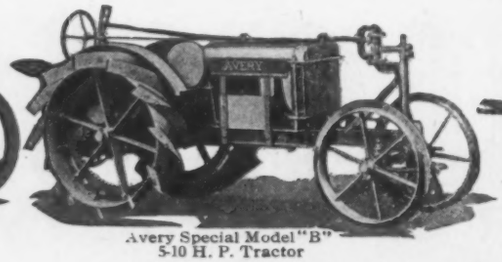
"Self-Lift" Independent Beam—3, 4, 5, 6 and 8 Bottoms



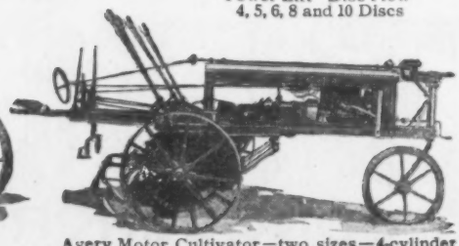
Newell Sanders "Power Lift" Disc Plow 4, 5, 6, 8 and 10 Discs



Avery 6-cylinder Tractor Model "C"



Avery Special Model "B" 5-10 H. P. Tractor

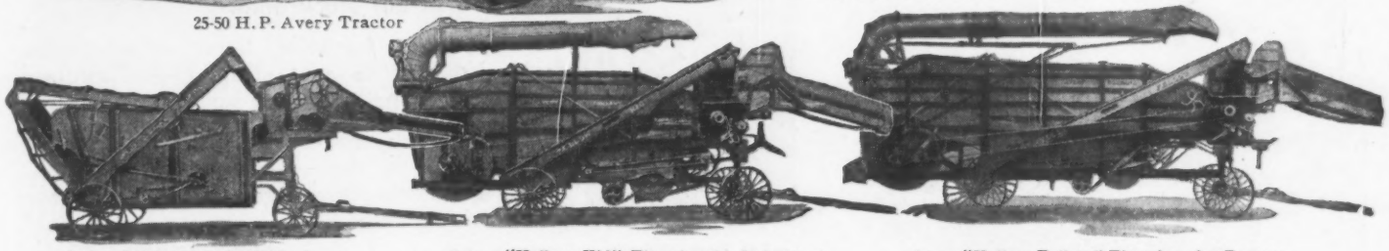


Avery Motor Cultivator—two sizes—4-cylinder One-Row and 6-cylinder Two-Row



40-80 H. P. Avery Tractor

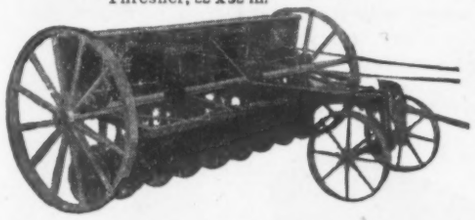
25-50 H. P. Avery Tractor



Avery Lightweight Individual Thresher, 22 x 32 in.

Avery "Yellow-Kid" Thresher for Individual and Small Runs, 20 x 30 and 24 x 36 in. Roller Bearing Equipped

Avery "Yellow-Fellow" Thresher, for Farmer-Company and Custom Work. 28 x 46, 32 x 54 and 36 x 60 in. Roller Bearing Equipped



Avery "Power-Lift" Tractor Grain Drill, 8 and 10 ft. widths



Avery "Self-Adjusting" Tractor Disc Harrow, 8 and 10 foot widths



Avery Skid Motor

See the Avery line at the Tractor Shows, Minneapolis, Minn., January 31 to February 7; Wichita, Kansas, February 9 to 14; Kansas City, Mo., February 16 to 21.

THE AVERY LINE includes six sizes of tractors, 8-16, 12-25, 14-28, 18-36, 25-50 and 40-80 H.P., all built alike, with the same standardized design, and two small Avery tractors, the model "B" 4-cylinder 5-10 H. P., and the Avery 6-cylinder tractor Model "C";

Light and Heavy "Self-Lift" Moldboard and Disc Plows, to fit every size tractor;

Two-Row "Self-Lift" Listers;

Power Operated, "Self-Adjusting" Tractor Disc Harrows and Drills;

Tractor Disc Harrow and Drill Hitches;

Four-Cylinder One-Row and Six-Cylinder Two-Row Motor Cultivators;

Roller Bearing Threshers in all sizes, for individual, farmer-company and custom work;

Silo Fillers;

Tanks for Fuel, Water and Combination;

Skid Motors, etc.

All are one-man outfits;

All tools operated from the tractor platform;

All tools "Power-Lift" and "Self-Adjusting";

All tractors coupled instantly at the drawbar, or belted instantly to any machine—belt pulley always in place.

RED



Red Line Combination Body Polish, Hood and Fender Dressing

For Jobbers:

A Complete Sample Line Sent Free Just Wire or Write for It

It takes just one look—or one trial—to convince jobbers who **are** jobbers, that wrapped up in every carton or can with the RED LINE trade mark on the front of it—there is a sale that pays.

It is so that you can get that one look—or make that one trial—that a **complete** sample line of RED LINE products is waiting for you in our stockroom.

Your request by wire, letter or telephone will bring it to you straight — absolutely without charge or cost to you.

Jobbers who know RED LINE products have them in their catalogs and in stock. The attractive containers close the sales our advertising starts.

RED LINE products are now being marketed nationally in answer to a national demand. They go big with dealers. Reorders come fast.

Write, wire, telephone—now.



Red Line Mohair Top and Lining Dye



Red Line Leather Renewer



Red Line Radiator Cement



Red Line Timer for Fords



Red Line Fossilac Shellac



Red Line Reliners

RED LINE Inc.

RED LINE

For Dealers:

Our Guarantee of Your Profits on Every RED LINE Sale

You may sell RED LINE products to your customers with the positive statement that their money will be returned if the goods are not entirely up to your expectations.

We in turn will return to you **not your price, but the retail price paid you by the customer.** We guarantee your profit on every RED LINE sale.

Wherever dealers have put in a RED LINE stock under the RED LINE guarantee—they have made good. Sales sprout from the attractive goldenrod, blue and red packages that identify RED LINE products on your shelves.

There is absolutely no chance for RED LINE dealers to go wrong. Our guarantee is based on the fact that we know RED LINE products will make good. They always have. They always will.

Present RED LINE sales are big. Future RED LINE sales will be bigger. It is worth while for you to share in the profits they bring.

Dealers: Stock from your jobber, and write for complete information.



Red Line Carbon Remover



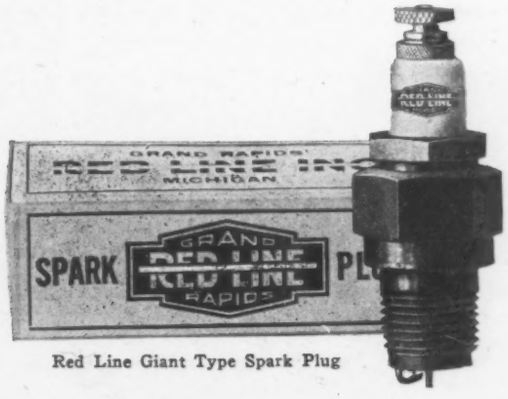
Red Line Spotnamel



Red Line Valve Grinding Compound



Red Line Penetrative Oil



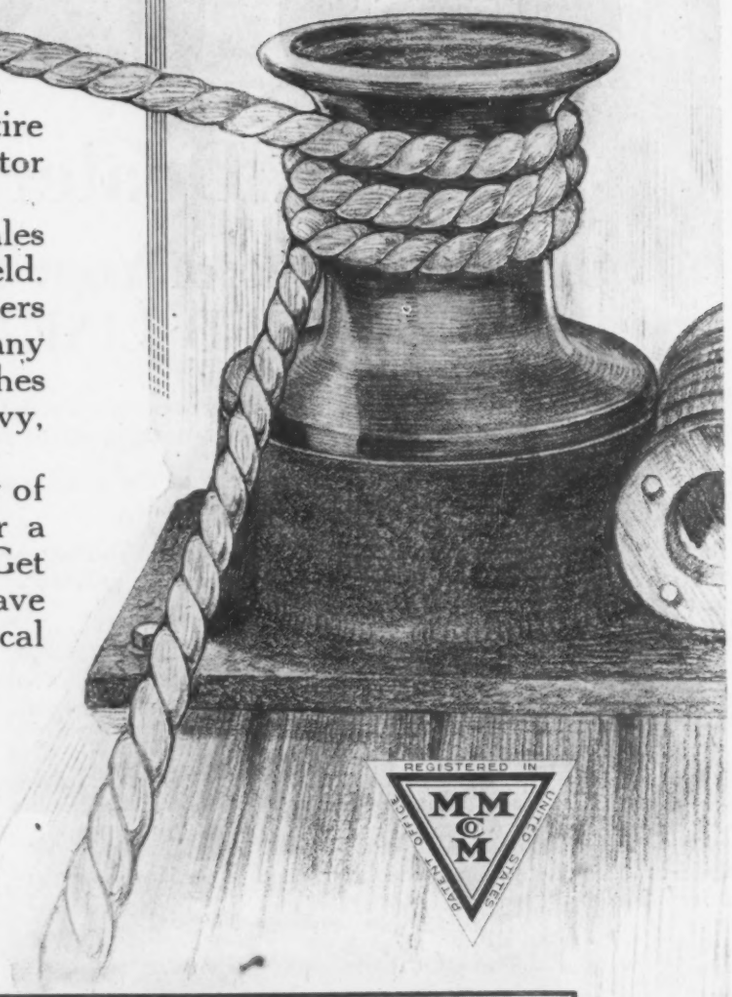
Red Line Giant Type Spark Plug



Red Line Transmission Set for Fords

Grand Rapids, Mich.

MEAD-MORRISON Truck Winches



Distributors are now being appointed to represent the entire Mead-Morrison line of Motor Truck Winches.

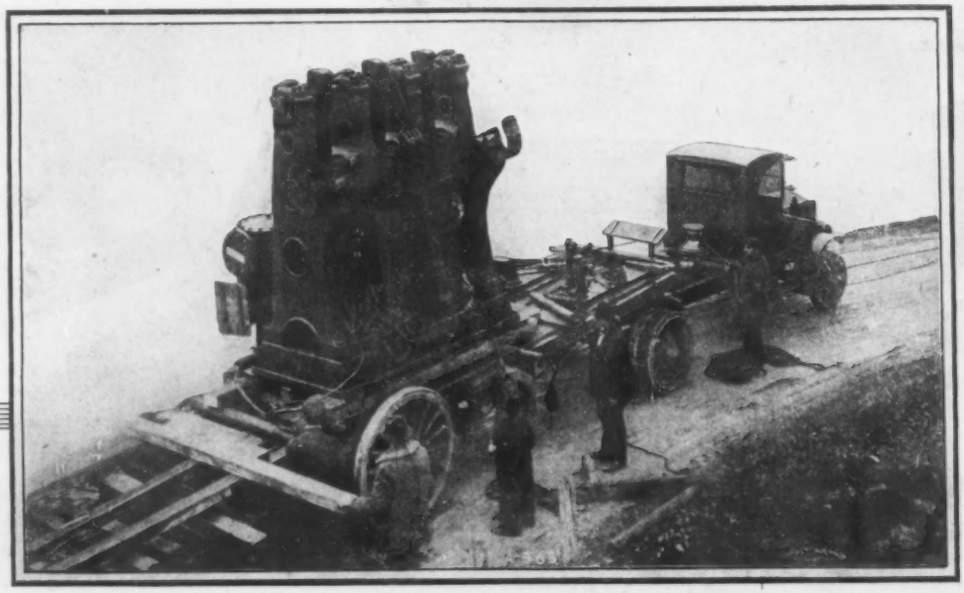
This represents an unusual sales opportunity in the truck field. Truck Dealers and Truck Owners have readily recognized the many advantages of our sturdy winches in handling all kinds of heavy, bulky loads.

There is, at present, territory of great possibilities available for a few live-wire distributors. Get your reservation at once and have the winches to exhibit at your local shows.

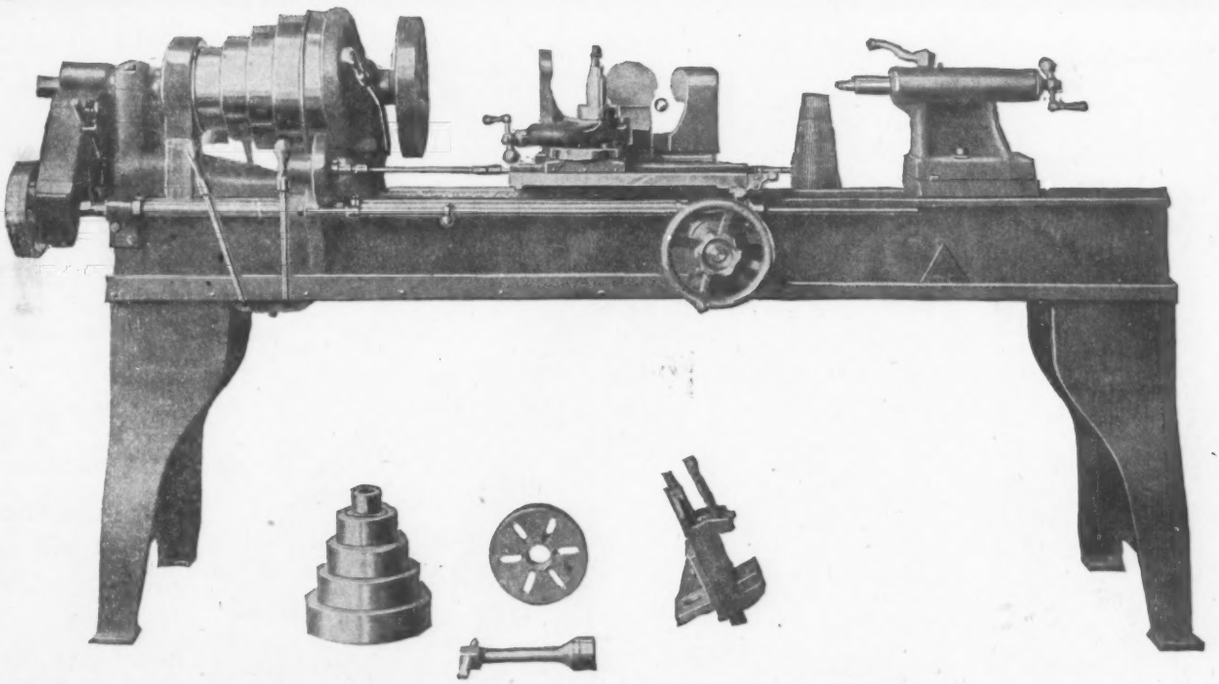
MEAD-MORRISON MANUFACTURING CO.

120 Prescott St., East Boston, Mass.
Welland, Canada

BRANCH OFFICES:
Singer Building New York — Montreal Canada — Monadnock Block Chicago



Landis Multi-Purpose Lathe



What the Landis Multi-Purpose Garage Lathe Is

—and what it will do

¶ It is a lathe that not only does the usual engine lathe work, but cylinder boring, drilling, milling, slotting, reaming, thread cutting, etc., yet costs no more than a single purpose lathe.

¶ It permits the use of any tool instantly without wasting time generally required to set up turning, engine or turret lathe.

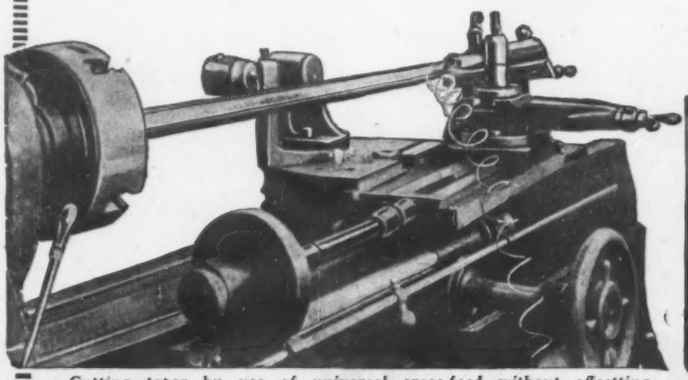
¶ It is built especially for garage work and designed to save the garage man space, labor and money. It has a planetary head, driving direct from line shaft, with shift levers located at left hand. It has a turret on which are mounted various tools, which on other lathes are extra equipment that must be attached.

¶ It serves as a drill press by using center carriage draw instead of the customary apron feed. It does thread cutting without having to set up special gears for the work. It mills keyways without removing other tools from the turret. It cuts tapers with tail stock at center by using universal feed on carriage.

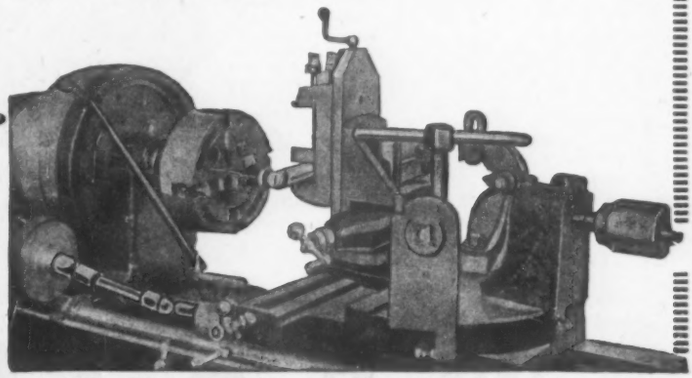
¶ The turret is easily removed, so heavy block work can be fastened to carriage for milling or boring. The cutting-off tool is easily attached for screw cutting and making.

¶ The speed can be changed without making adjustments. Has 1⅝ inch hollow spindle.

WRITE FOR CATALOGUE AND PRICE



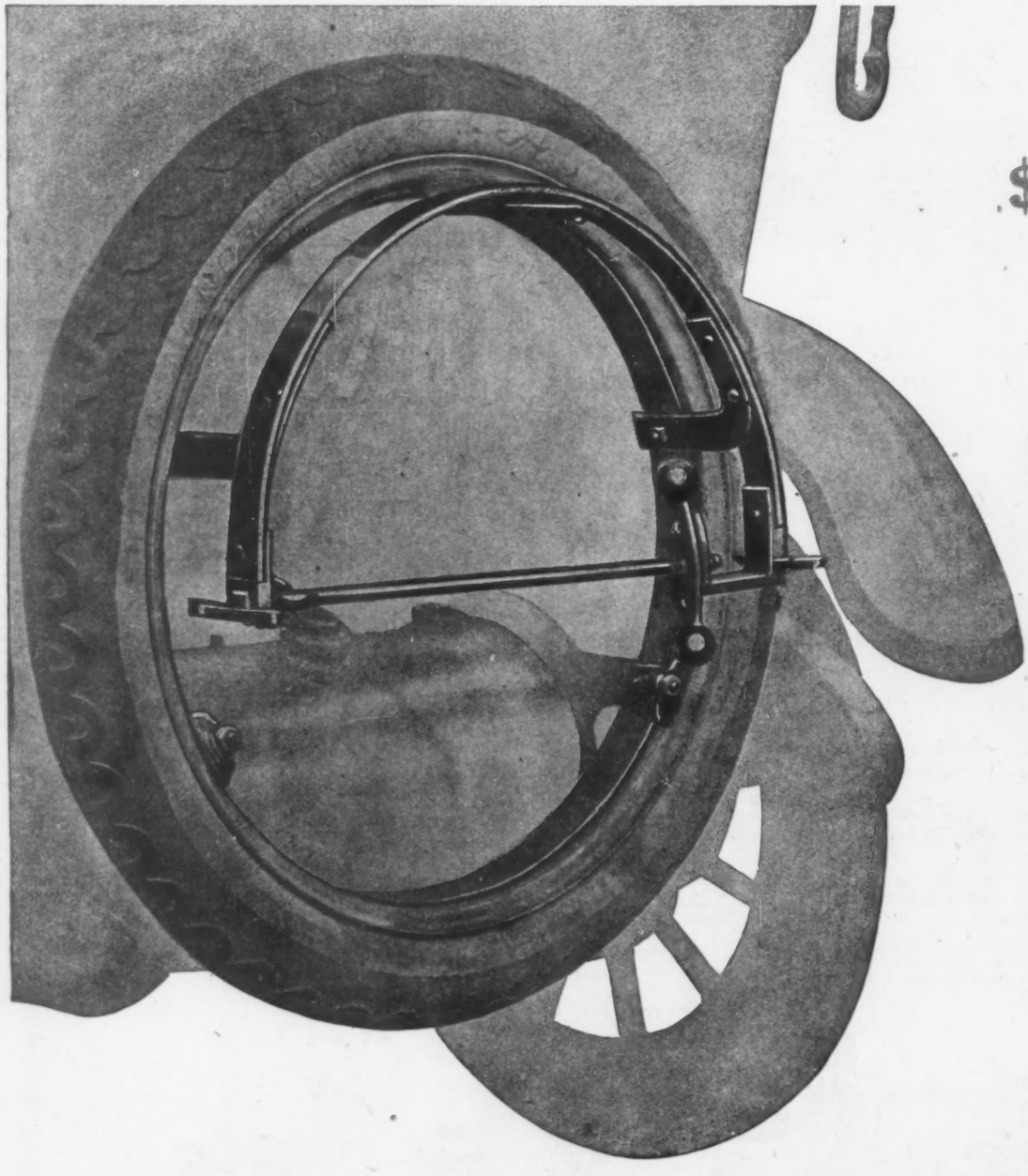
Cutting taper by use of universal cross-feed without offsetting tail stock. (The thread-cutting and centering tool remaining on turret)



Milling keyway, showing improved milling vise, which can be used at either side or end of compound rest, as may be desired. Vise held in position by tool post

T. TYLER BOGGS CO., **206 Abbott Bldg., Philadelphia, Pa.**

Acts Quickly—Locks Securely—



$12

This investment of $12.00 will enable your car-owning customer to bring home one, or even two, badly worn tires which may have many hundreds of miles service in them. Without it he would possibly throw them away. Also it's a mighty comfortable thing to know that there are two good tires in reserve.

AMERICAN TI

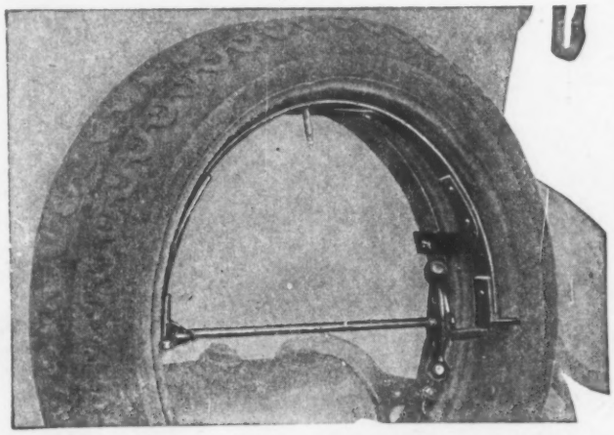
—Sells On Utility and "Looks"

Sometimes he needs it—occasionally he could do without it, but it's always there—on the job and ready to carry out tire travel convenience and economy clear to the limit.

And it is the utility of the American Tire Carrier that is increasing its sales wherever it is known. The convenience and security of this simple device hold a strong appeal to car owners.

We present it here in picture.

In its simplicity it needs no lengthy explanation.



A simple turn of the handle in one direction draws in the ends and permits the placing of the tire. A reverse turn expands the ends, clamping the tire in position. A lock may be used on the handle, thus securing both tires.

Four sizes cover all tires ranging from 30 x 3½ to 35 x 4½, and so all requirements are provided for. Also note that the "American" can be fastened to any circular single carrier by simply drilling and countersinking three holes and fastening by bolts.

To Jobbers, Distributors and Dealers

The arrangements we make with you are liberal, and our enlarged facilities enable us to give prompt service on all orders, large or small. **Write or wire.**

DEALERS—Order from your nearest jobber. A list of those already handling the American Tire Carrier is given on this page.

AMERICAN TRACTION RING CO., Inc.
WHITE PLAINS, NEW YORK

LIST OF JOBBERS

The Automobile Supply Co.,
1335 S. Michigan Ave., Chicago, Ill.
Auto Supply Co. of Baltimore,
916 N. Charles St., Baltimore, Md.
Albany Hardware & Iron Co., Albany, New York.
E. A. Bowman, 719 John R. St., Detroit, Mich.
Beals, McCarthy & Rogers,
40 Terrace, Buffalo, N. Y.
Beckley Ralston, Chicago, Ill.
Elmira Arms Co., 117 Main St., Elmira, N. Y.
The Gibson Co., Indianapolis, Ind.
Gaul Derr & Shearer Co.,
217 N. Broad St., Philadelphia, Pa.
The C. S. Mersick & Co., New Haven, Conn.
Martin-Evans Co.,
Bedford Ave. at Bergen St., Brooklyn, N. Y.
National Electrical Supply Co.,
1328 New York Ave., N. W., Washington, D. C.
Thomas J. Northway, Rochester, N. Y.
Pennsylvania Rubber & Supply Co., Cleveland, O.
Pittsburgh Auto Equipment Co.,
5933 Baum Boulevard, Pittsburgh, Pa.
W. E. Pruden Hardware Co., 864 8th Ave., N. Y. C.
Syracuse Auto Supply Corp.,
311 S. Warren St., Syracuse, N. Y.
Tarbell-Watters Co., Inc.,
160 Chestnut St., Springfield, Mass.
Thompson-Reilly Co., 277 Halsey St., Newark, N. J.
Waite Auto Supply Co.,
64 Exchange Pl., Providence, R. I.
Wetmore-Savage Co.,
180 Massachusetts Ave., Boston, Mass.

I RE CARRIER



GILL

The Perfect One Piece Piston Ring

"The car is going fine since you put these Gill Rings on the motor."

Isn't that the kind of commendation that brings joy to the heart of the garage man? It brings money to his pocket too, for a satisfied customer is a big asset to business.

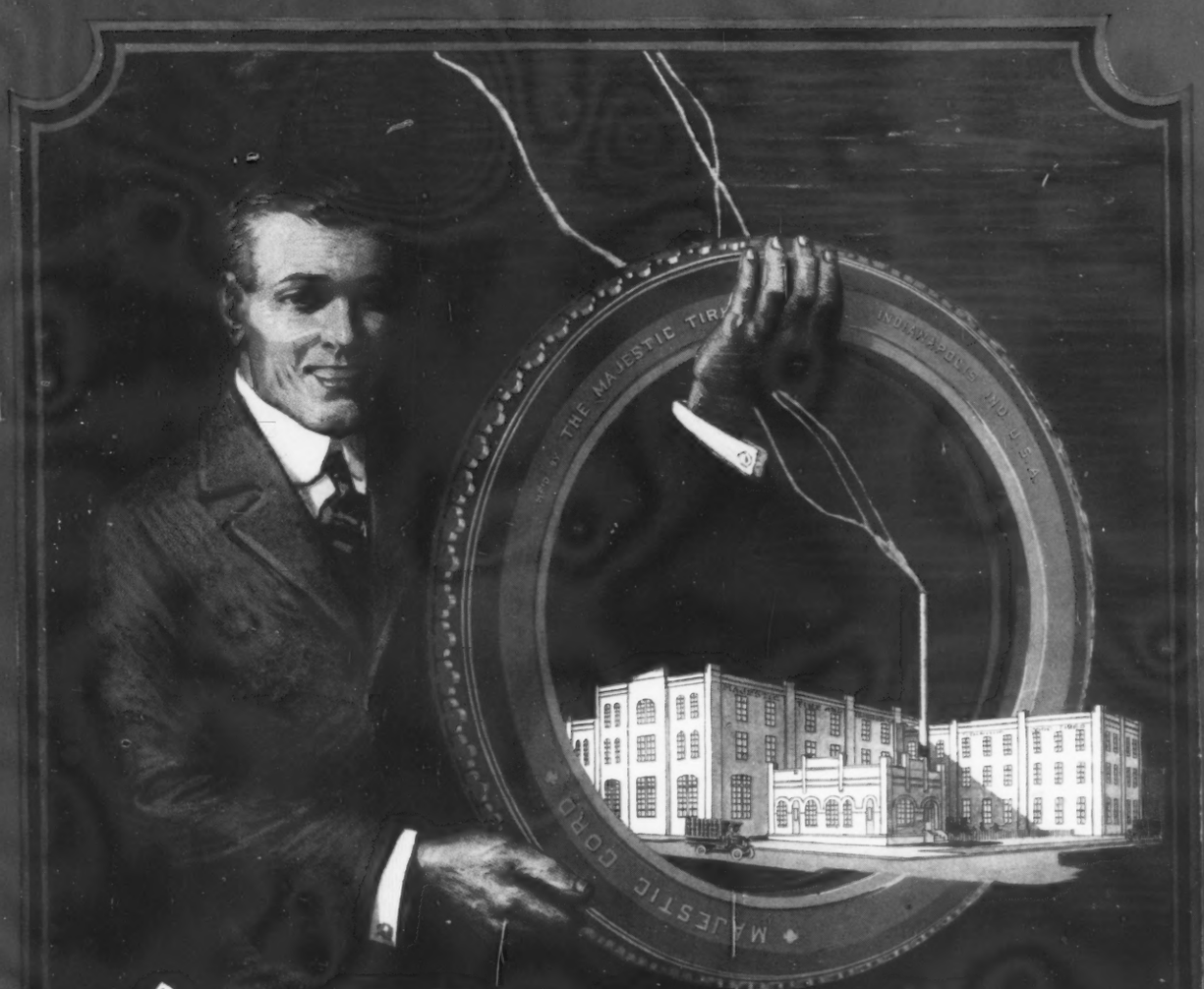
It is the kind of talk the motorist gives when a set of Gill Piston Rings have been installed on his motor and naturally there's a reason for it. Look at the double step interlocking joint of the Gill Piston Ring and you will see the reason at once. An absolutely tight joint, with no loss of compression whether the cylinder is new or worn. The Gill Ring allows an expansion of from 1/8" to 3/16" before any loss of compression occurs.

Send for the new Gill Piston Ring Size Directory, complete, convenient and full of just the information you need. It is free to the trade.

Dealers—Ask your jobbers about them
Jobbers—Write to us for information

The Gill Manufacturing Company
8301 South Chicago Ave., Chicago, Illinois

Sole Foreign Agents
AUTOMOTIVE PRODUCTS CORPORATION
Woolworth Building, New York, N. Y.



Majestic

MAJESTIC
33X5 CORD
TITANIUM

To handle Tires Profitably ''' The Distributors' Problem!!!

A Common-Sense View of the Situation. Facts Only ''' No Flowery or Unkept Promises.

They Pay THEIR WAY

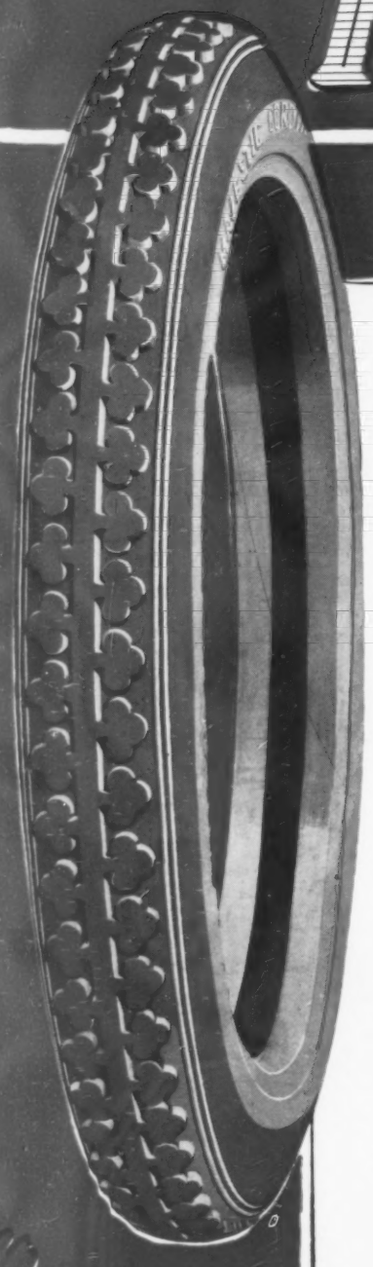
An Unchanging Permanent Franchise ''' Longer Profits ''' A Quality Product.

A Protected Distributor ''' A Perfected Tire.

A Distributorship Seeking the Permanent Type of Merchant.

THE MAJESTIC TIRE *and* RUBBER CO. ''' INDIANAPOLIS, U. S. A.

Majestic

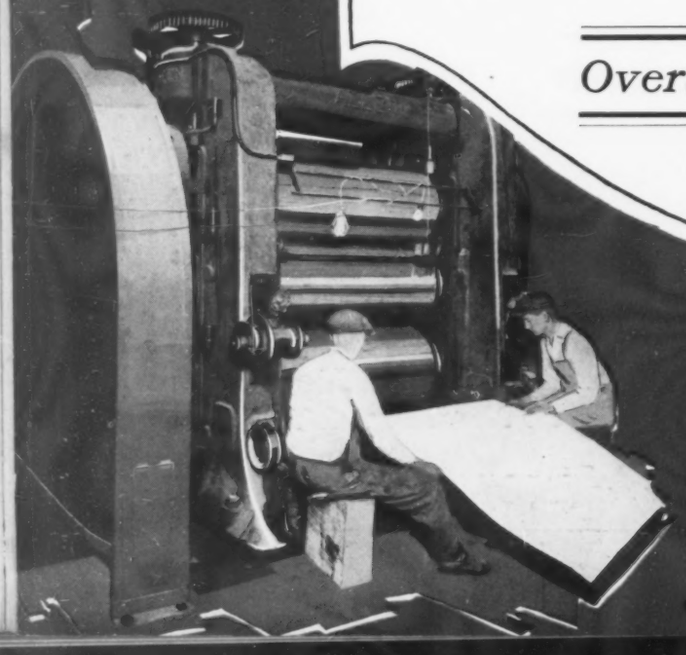


THERE is no mystery in the construction of *Majestic Titanium Cord Tires.* With the best raw rubber obtainable, the highest grade fabrics from long staple cotton, selected compounds, proper design, highly developed equipment, conscientious workmen and a rigid policy covering production and inspection, the resulting product is as near perfect as human ingenuity can make it. Common sense and close attention to the interests of the Distributor and Consumer are the principal factors in the success of the Majestic Company.

Majestic Titanium Cord Tires (Fabric, 30 x 3, 30 x 3½, 31 x 4; all other sizes, Cord) are constructed on scientific principles. Eliminating all the former worries experienced with Cord Tires. A new process of impregnation insures uniform distribution of the rubber throughout the Cord, or Fabric, structure and gives even resistance to internal pressure and external shocks.

Majestic Titanium Cord Tires have long since passed the experimental stage. Nothing in materials, design or process is doubtful. There is an honesty of purpose and a lasting interest in the results this product will give the ultimate purchaser.

Oversize ,,, Overservice





Majestic

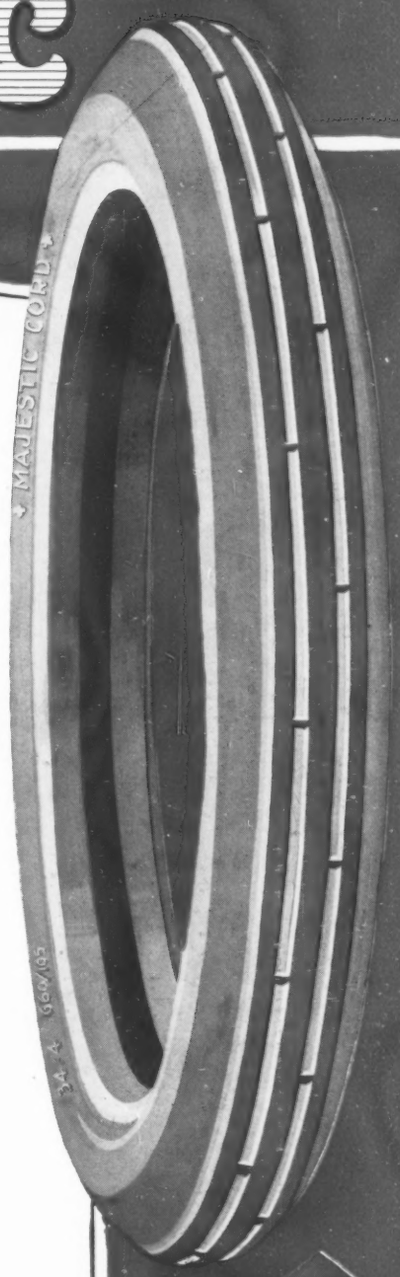
THE *Majestic Titanium Cord* is the result of many years' experience in the building and selling of Tires. Men who have spent their lives in the industry are responsible for process and design. This Tire is the full expression of their observation, study and experience.

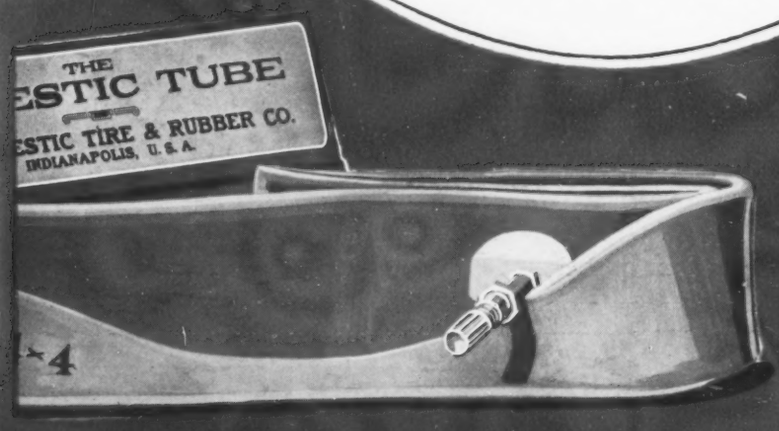
Built in a big daylight-factory with full modern equipment. By workmen, every one a specialist, who build individual reputation and pride into every casing and tube leaving this plant.

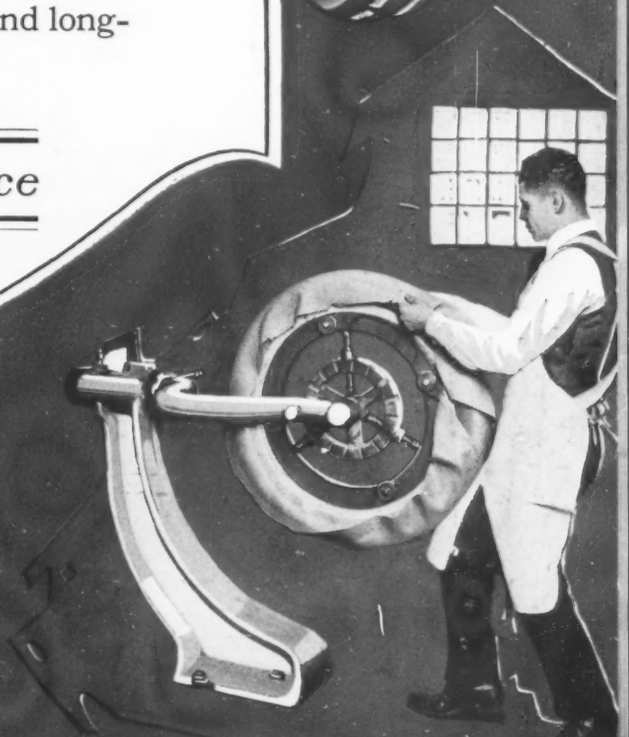
A Distributor handling the *Majestic Titanium Cord* is assured protection in the matter of uniformity. Our output is limited—we do not build tires for the sake of large production and fast turnover. We are jealous of our quality, and will maintain it at the highest possible point regardless of any other consideration.

Majestic Titanium Inner Tubes are of extra heavy section, made of pure rubber with just enough compound to prevent deterioration. Distributors say it is the best looking and longest lived tube they have ever sold.

Oversize ,,, Overservice

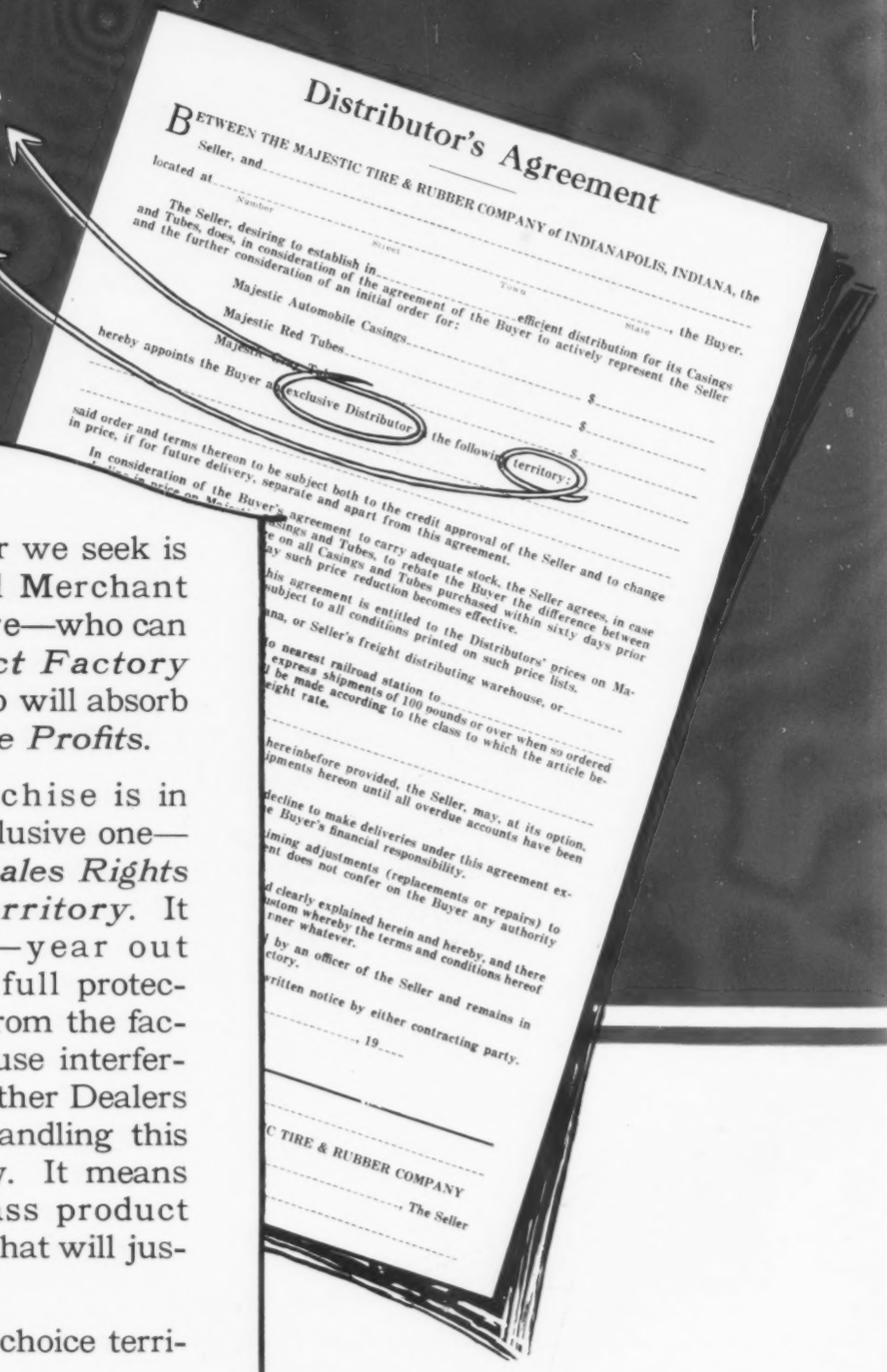






Majestic

Exclusive Territory



THE Distributor we seek is the substantial Merchant looking to the future—who can appreciate a *Direct Factory Connection* and who will absorb *All the Intermediate Profits*.

The Majestic franchise is in *every sense* an exclusive one—it means the *Sole Sales Rights* in an *exclusive territory*. It means a year in—year out arrangement—with full protection and assistance from the factory. No branch house interference—no danger of other Dealers and Distributors handling this line in your territory. It means handling a high-class product with a profit return that will justify your best efforts.

We still have some choice territory to be allotted.

Write or wire at once.

The Majestic Tire and Rubber Co.
INDIANAPOLIS
U. S. A.

ROSS STEERING GEARS



Contented Drivers Mean Greater Efficiency from Man and Motor Truck

About 85 per cent. of the actual operation cost of a motor truck is represented by the salary of the man who drives it. This is a fact which must be considered both by the manufacturer or dealer who sells the truck and by the man who buys it.

All the time that the truck is running, the steering gear must be operated by the hands and the arms of the driver. Easy steering conserves human strength, makes a more contented driver, and means a bigger day's work more easily done.

Because their enormous bearing surfaces guarantee easy steering, safety and reliability, and thus increase efficiency, 165 motor truck manufacturers are now using Ross Steering Gears as standard equipment.

Write for further information

ROSS GEAR & TOOL COMPANY
400 HEATH STREET, LAFAYETTE, INDIANA, U. S. A.

The Steering Gears that Predominate on Motor Trucks

PUTS NEW DRIVING POWER IN CARS

Install the Piston Ring That Expands in Width and Diameter

Motor ills vanish when Wedge Rite Piston Rings go on—no more fouled plugs, scored cylinders, leaks or lost power.

A wedge shaped ring of untempered spring steel pushes outward and upward on the two outer bearing rings, of soft gray iron, holding the ring from creeping in the groove. This exclusive Wedge Rite feature puts new life in the old motors. Used motors have out of round cylinders, so that the non-rotating Wedge Rite Piston Rings soon accommodate themselves to the cylinder—lapping into a perfect contact with the cylinder.

Installing Wedge Rite Piston Rings save motorists the inconvenience and cost of reboring cylinders. Jobbers, Dealers, write for liberal sales proposition.

The cross section of the ring shows section 1 pressing outward and upward—section 2, the spring wedge section of ring and section 3, pressing outward and downward.

THE WEDGE RITE PISTON RING CO.

Plattsburg, New York

MONTREAL, CANADA



THE DEWITT G. SALTSMAN CO., New Haven, Conn.

BEST DIS. COMPANY, Kansas City, Mo.

NATIONAL A U T O SUPPLY CO., Chicago, Illinois.

CRESSY BROS., 979 Woodward Ave., Detroit, Mich.

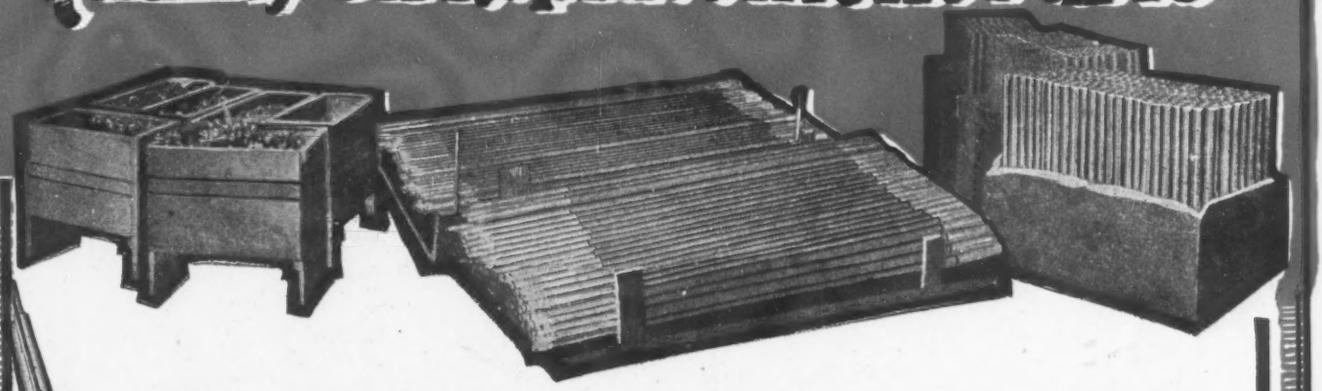
J. E. BENEDICT CO., 1212 Figueroa St., South, Los Angeles, Cal.

HARRY G. BOW, 715 Rose Bldg., Cleveland, Ohio.

B. & S. DISTRIBUTING CO., 209 Mass Ave., Boston, Mass.

SPENCER

The Name That Guarantees Quality On Replacement Parts



YOU dealers who handle replacement parts have got to stand back of those parts or lose your reputation for service.

That's why you will appreciate Spencer Guaranteed Replacement Parts—machined with care and accuracy from the best of material and stamped with the name *"Spencer"* as a guarantee of quality.

The present modern, finely equipped, Spencer factory is the development of the firm belief that Quality pays Dividends.

When you sell any Spencer guaranteed product, you can be absolutely certain that it is the equal of the original part in every respect and will give entire and lasting satisfaction.

Spencer Guaranteed Parts are sold only through jobbers—stamped with the *"Spencer"* trademark—made in sufficient quantities to insure prompt delivery at all times—*Unconditionally Guaranteed.*

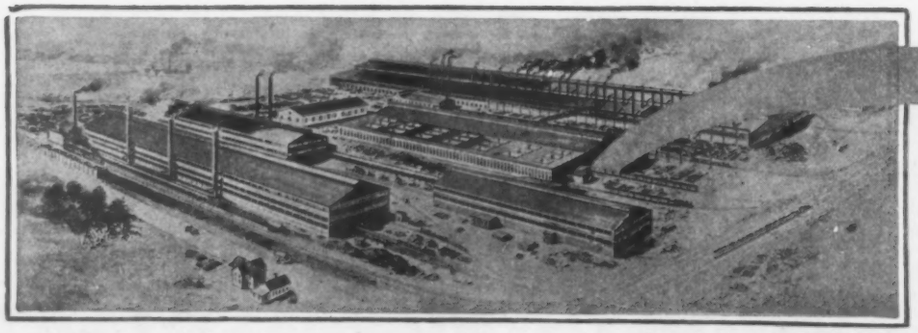
Spencer Guaranteed Products include:

Axle shafts and drive shafts for all popular makes of cars.
Connecting rods, radius rods, fans and mufflers for Fords.
Gilliam take-down taper roller bearings for light cars and commercial trucks.

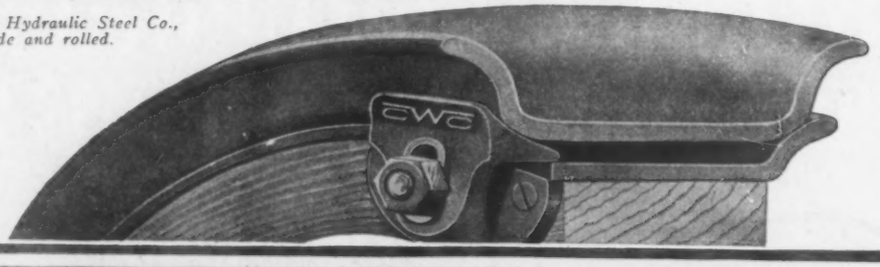
Spencer Quality Costs You no More

THE SPENCER METAL PRODUCTS CO.
624 S. Michigan Avenue, Chicago
and 16 to 24 West 61st St., New York

THE SPENCER METAL PRODUCTS CO. SPENCER SPENCER, OHIO.



Canton Sheet Steel Plant of the Hydraulic Steel Co., where rim sheets are made and rolled.





Interior of the Cleveland Welding Plant. Here rims are finished and stocked.

Cleveland Welding

Three Reasons Why

You Should Specify

CWC Standardized Rims



1. Standardized Rims have been approved and are produced by five prominent rim manufacturers.

2. Standardized Rims are recognized as having all the best features. They meet adequately every present-day requirement.

3. Standardized Rims made by The Cleveland Welding and Manufacturing Company of The Hydraulic Steel Company are the product of contented minds. Every man in our shops is more interested in the quality of his workmanship than in merely completing the daily grind.

Cleveland Welding products include Goodyear Detachable Rims for Wire, Disc and Wood Wheels; Goodyear Demountable Rims; Standardized Demountable Rims; Clincher Rims; Tire Bases for Solid Tires; Flanges and Motor Truck Wheel Bands; Gear Ring Forgings; Special Electrically Welded Rings; Special and Irregular Shapes of Tubing.

"MORE than a Place to Work"

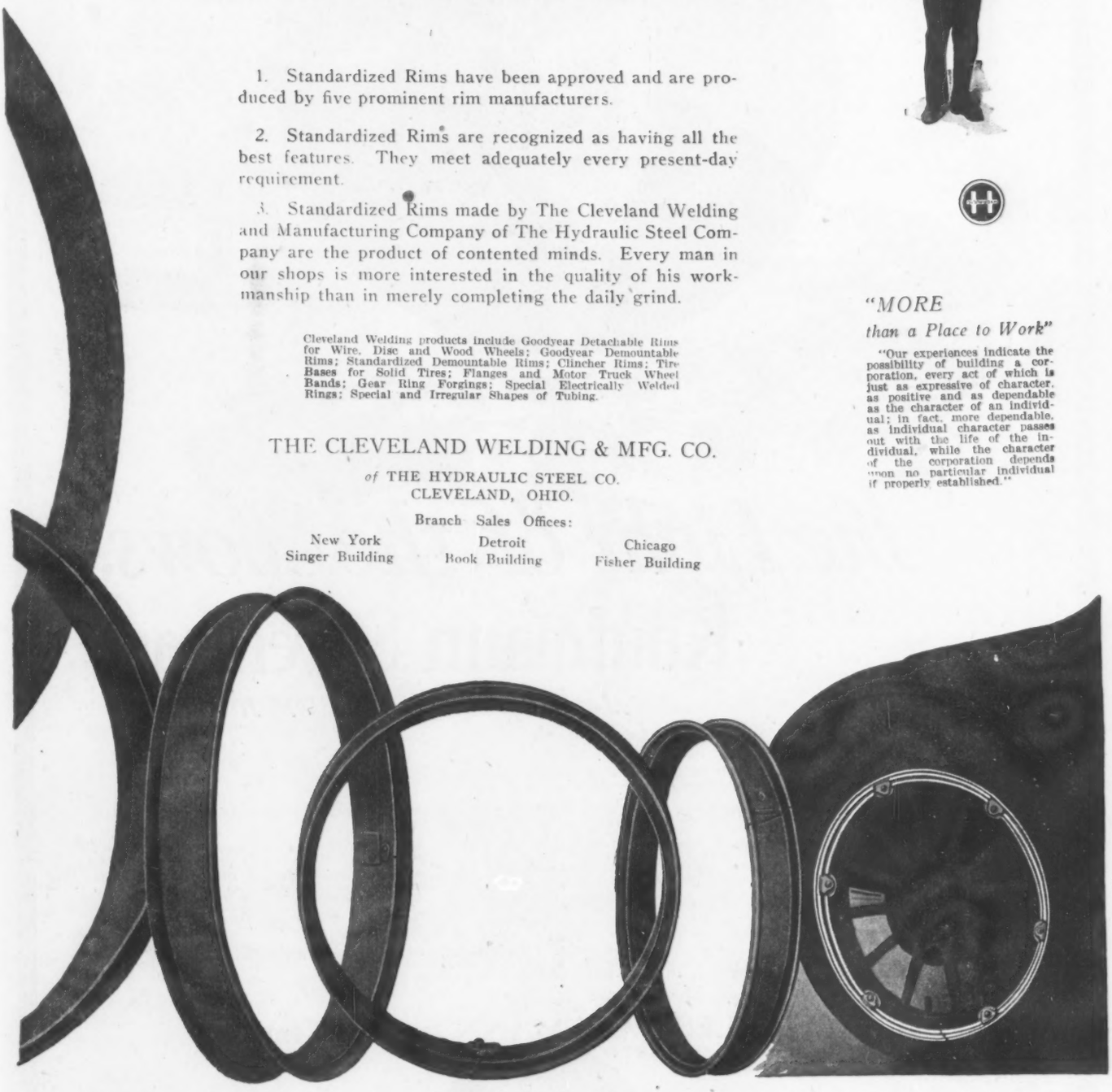
"Our experiences indicate the possibility of building a corporation, every act of which is just as expressive of character, as positive and as dependable as the character of an individual; in fact, more dependable, as individual character passes out with the life of the individual, while the character of the corporation depends upon no particular individual if properly established."

THE CLEVELAND WELDING & MFG. CO.

of THE HYDRAULIC STEEL CO.
CLEVELAND, OHIO.

Branch Sales Offices:

New York	Detroit	Chicago
Singer Building	Book Building	Fisher Building



& Mfg. Co. *of the* HYDRAULIC PRESSED STEEL CO.



The Light of the Shows!

Kaufmann Silverbeam

The Spotlight Supreme!

TESTED by thousands of motorists during the past five years—and now approved by the entire motoring fraternity.

Kaufmann SILVERBEAMS Spotlights are not miniature headlights but genuine spotlights—dependability built for exactly motorists.

They project a powerful pencil of light far ahead into the darkness. In projection power, construction and beautiful, practical design they are unrivalled—being truly the Spotlights supreme.

Quickly detached, they make efficient, portable inspection lights. Always a useful accessory, their clean, thoroughbred design ornaments the finest cars.

Now being furnished to Marmon, Pierce-Arrow, Reamer, and other well-known makes.

Finished in Black, Red, or Olive Drab, optional; with specially designed brackets for every make of car or windshield.

First Class Dealers everywhere carry Kaufmann Silverbeams.

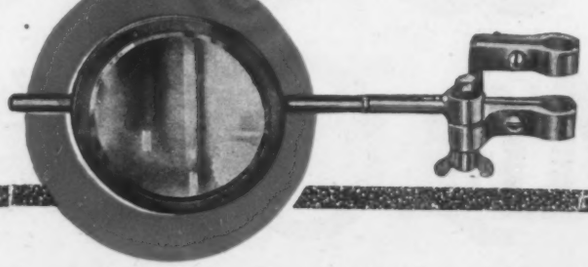
We shall exhibit at the Chicago Motor Truck Show, International Amphitheatre, Stock Yards, January 24 to 31. Take South side elevated and change at Indiana Avenue for Halsted Street Station.

CHARLES KAUFMANN & SONS, Inc.

SANTA ANA, CALIFORNIA

The Kaufmann Rear Sight Mirror

The handsomest, practical rear-sight mirror made. Constructed of brass, heavily nickeled; with special convex enlarging mirror. Staunch, rigid construction—non-vibrating. Adjustable as to angle and length. Fits every windshield.



Dealers — Jobbers: The live, profitable line is the Kaufmann. Investigate and be convinced. Write for latest catalog and price list.



Simplified Automotive Soldering

The work of soldering has been greatly simplified by the introduction of a self-fluxing wire solder—a solder that eliminates the need of any separate fluxing agent. For a quick repair job all you need is a hot iron and a coil of—

Kester Acid-Core Wire Solder

It has a core which consists of a series of little pockets filled with acid-flux. As solder is melted off, the pocket nearest the melting solder is opened up and the flux allowed to flow out on the job.

Saves Time and Material

Kester Acid-Core Wire Solder saves time and material, because it is always ready for use, requires no preparing of flux and because every job is properly done the first time. No material—solder or flux—is wasted in the operation. Just enough flux always flows to the job automatically.

It is sold in one pound coils in cartons and on one, five and ten pound spools.

Ask your jobber or supply house for it. If they can't supply you, write us.

Ask for a FREE sample

CHICAGO SOLDER COMPANY

Manufacturers

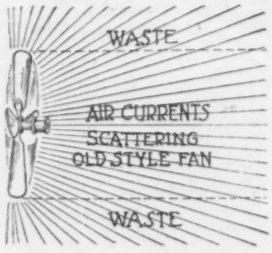
218 No. Union Ave., Chicago

Pacific Coast Distributors: Sierra Electric Co., San Francisco, Cal.
Southern Distributors: Faucette-Huston Co., Chattanooga, Tenn.



A one pound carton of KESTER ACID - CORE WIRE SOLDER.

A Lesson in Proper Cooling—







THE *proper* cooling of motors prevents both overheating and chilling.

The JUELSON TWO-BLADE FAN is so constructed as to deliver the air currents in a *parallel shaft*, as a searchlight throws its rays of light.

The air currents are *directed* and made to pass along ALL the surfaces of ALL the cylinders, completely bathing the engine in fresh air.

All of the air currents which in the old-style fan are diffused and dissipated, chilling the first cylinder and escaping through the louvres—all of these currents are in the JUELSON TWO-BLADE FAN concentrated, directed and delivered where you need them, maintaining the proper running temperature evenly throughout the entire motor.

Proper air distribution makes proper water distribution.

The many thousands of replacements with this fan have proved that it *absolutely* prevents overheating and chilling, under the most trying circumstances—on the level or up the steepest grades.

DEMONSTRATION—Dealers may see a complete and very interesting demonstration of all of the properties of this fan at their jobbers'. It establishes a new epoch in aerodynamic engineering, and its actual performance will prove a revelation.

It enables Fords and Chevrolets to demonstrate their full efficiency and usefulness.

Models for Ford and Chevrolet ready for delivery.

List Price: Ford, $1.20; Chevrolet, $2.60.

AMERICAN AERO COMPANY

JUELSON

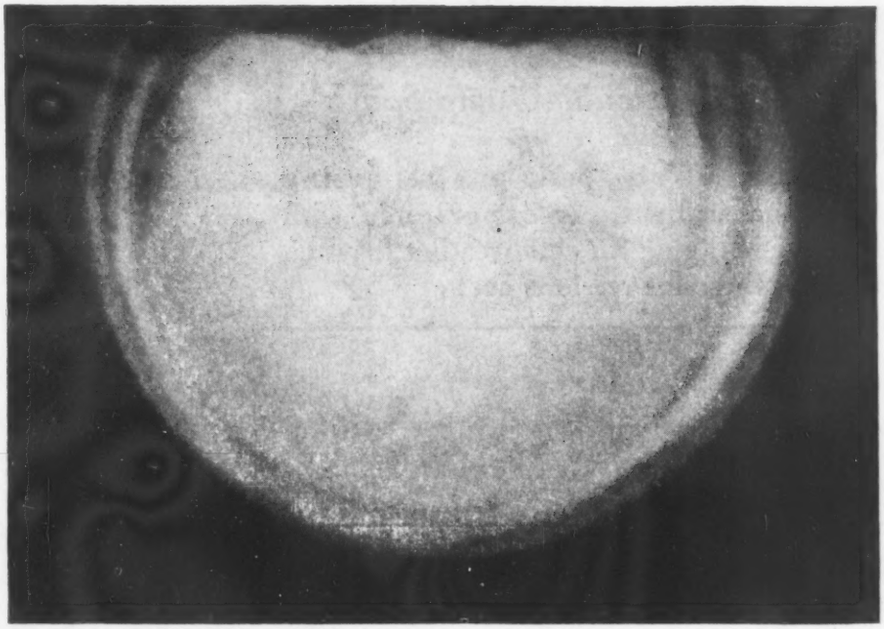
Trade Mark

Peoples' Gas Bldg.
Sales Department
J. Wadsworth Staff
122 S. Michigan Blvd.
CHICAGO

New York Baltimore Atlanta Dallas San Francisco Toronto Winnipeg Vancouver

AE 11

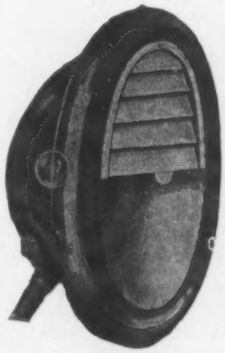
When Your Light Looks Like This



You Know it Is Where You Want it

The photograph shows how the light from a headlamp equipped with a Full-Ray Deflector looks when thrown on a screen 100 ft. distant. The upward rays that cause the dangerous glare have been cut off entirely. The light of these rays which was wasted before has been concentrated below the 42-inch line where you ned it.

The Full-Ray Deflector is unique in design. It is an all-metal shade that fits snugly between the reflector and the glass. It absolutely does away with the dangerous direct upward rays, giving you better protection than any other device, without diminishing the road lighting power of your lamps.



The Full-Ray Deflector has been awarded the highest rating attainable by the Testing Laboratories of State Highway Departments. It fulfills the law in all respects and gives you a maximum efficient, unbreakable deflector.

Easily installed. Fits snugly between the reflector and the glass. It is handsomely finished in copper lacquer.

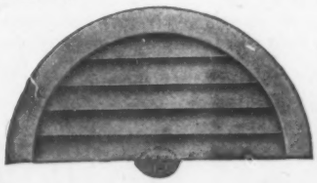
Dealers and Jobbers not yet handling Full-Ray should write us at once. Your stock is incomplete without it.

Eastern List—Ford (8") size $3.00 per pair.
Other standard sizes, $3.50 per pair.
Western List, $0.25 higher.

BRADSTO APPLIANCES, INC.

Sole Manufacturers

65 MAIN ST., BUFFALO, N. Y.



FULL RAY

HEADLIGHT ALL METAL DEFLECTOR

VIZ-SPARK

"The Plug with the Double-Jump Spark"

Price $1.50

Mail Orders Filled where dealers cannot supply you.

Users of Viz-Spark are reporting enthusiastically their experience with this wonderful plug for cold weather driving. Summed up, these expressions are:

That Viz-Spark actually gives a car more miles per gallon of gasoline.

That Viz-Spark reduces engine trouble to a minimum; and when trouble does occur, assists you in locating it by means of the visible spark in the top of the plug.

The reason for the above advantages lies in the fact that Viz-Spark has an intensified spark. This is not a theoretically increased intensity, but an actual increased intensity, and is due to the fact that Viz-Spark has a double jump spark.

Any electrical engineer will tell you that a double jump spark has increased intensity at the second jump, which, in Viz-Spark is in the firing chamber.

An intensified spark insures complete combustion, which means less carbon, elimination of fouling, and prevention of valve sticking. Also, it makes possible the use of a lean gasoline mixture, and makes cold weather starting easy.

Put Eyes in Your Motor

A visible spark in the top of the plug shows the condition of the ignition and combustion systems of the motor.

A small bluish white spark, when uniform on all plugs, indicates uniform compression and ignition on all cylinders.

A larger yellowish spark on one or more plugs indicates loss of compression or excess of oil in corresponding cylinder.

A large red spark indicates that the plug is not firing.

No spark indicates an open circuit in the wiring or distributor.

A Special Word to Viz-Spark Users

All users of Viz-Spark please note that owing to the intensified spark it is usually necessary to readjust your carburetor when a set of Viz-Sparks is first installed. Viz-Sparks produce complete combustion, which means a lessened gasoline consumption. This saving of gasoline is very noticeable when a complete set of Viz-Sparks is used. So if you have what you think is trouble with Viz-Sparks, remember it is only the plug's way of telling you to reduce your mixture.

Dealers, when selling plugs, please call attention to these instructions. They are printed on each carton.

Dealers pretty generally can supply you with Viz-Sparks, but in case your dealer cannot, mail order will be filled. Write plainly number of Viz-Sparks wanted, size of plug, make and model of your car, and remit at the rate of $1.50 for each plug. In order to get the full and complete advantages these wonderful plugs will give you, we always recommend installation of a complete set rather than that of merely one or two plugs.

Dealers not selling Viz-Sparks will find it to their advantage to write at once for our unusual proposition.

The Clamert Manufacturing Company, Pittsburgh, Pa.

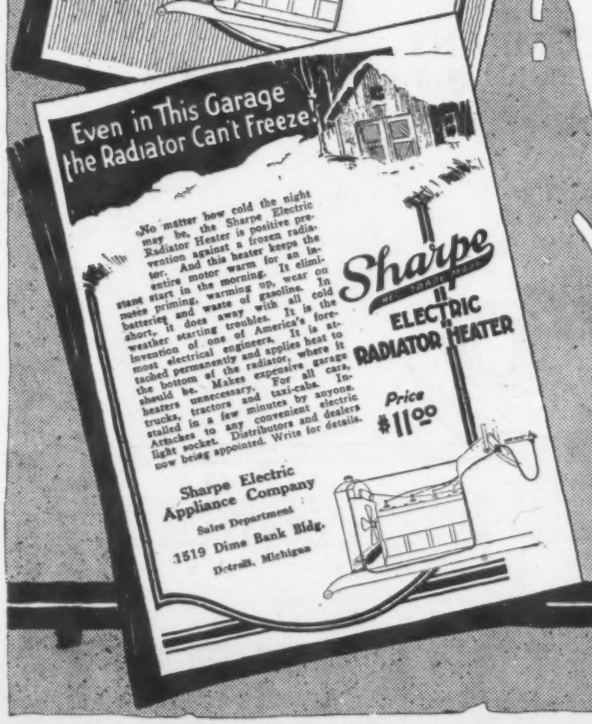
You Can See the Spark



Have You Been Following *the* Story?







For the past couple of months we've been telling a story chuck full of importance to you—a story that deals with boosting winter profits—a story about one of the biggest successes among winter products; the Sharpe Electric Radiator Heater. If you are not familiar with the story, get it now. We're talking about a bigger business this winter.

After two years of experimenting, a permanently attached radiator heater that will outlast any car or truck is here at last! And the whole secret is in the patented heating element—thoroughly practical and exceedingly durable because particularly designed for automotive use. This element is enclosed and water-proof.

Take note that the Sharpe is the only permanently attached radiator heater.

And furthermore, the Sharpe is the only radiator heater which applies heat at the BOTTOM of the radiator. It keeps the water in the radiator and water jackets continuously hot all night long and ensures a quick, sure start in the morning, no matter how cold the weather. Saves gasoline by eliminating priming or warming up. Prolongs life of storage battery and starter. Eliminates necessity of draining radiator and filling with hot water. Makes expensive garage heaters unnecessary.

SOLD ON A 10-DAY MONEY BACK TRIAL

For All Passenger Cars, Trucks, Taxi-cabs, Tractors,

Anyone Can Install in Few Minutes.

Price $11.00, Complete

Distributors and Dealers Are Now Being Appointed. Write for Our Proposition

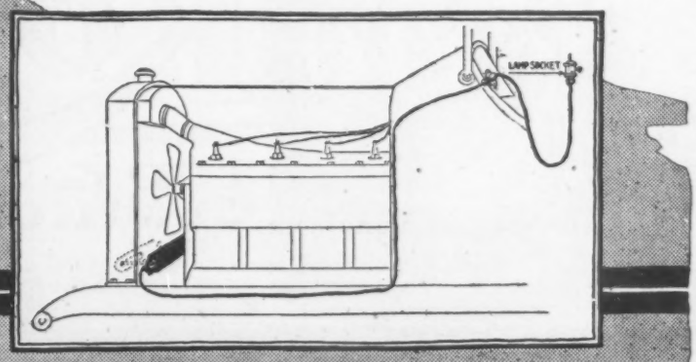
SHARPE ELECTRIC APPLIANCE CO.

Sales Dept., 1519 Dime Bank Bldg., Detroit, Mich.

Sharpe

REG. TRADE MARK

ELECTRIC RADIATOR HEATER



6 Big Reasons for Selling KOTO Top and Cushion Dressing.

1—Protects and preserves leather, rubber, mohair, and their substitutes.

2—Does not crack or check.

3—Waterproofs without shrinking.

4—Will not fade or discolor.

5—Unaffected by heat or cold.

6—Saves the expense of carrying several dressings for each kind of top and cushion material.

KOTO protects, preserves and waterproofs Rubber, Mohair, Leather and their substitutes.

It gives the dealer a **universal** dressing that maintains the original value of the customer's car, and prevents early depreciation caused by shabby top, cushions and curtains.

You can go the limit in recommending KOTO for any of the materials listed, and KOTO will back up your claims.

Your customer will appreciate a dressing that will lengthen the life of his top and cushions, and restore their good looks—and **keep** them looking good for a surprisingly long time.

KOTO—in two finishes—Glossy or Eggshell—is without question the most practical and universal dressing available. It combines all the advantages of the various individual material dressings in a single preparation which positively fulfills every statement in our advertising.

Write for Discounts

GLIDDEN SALES COMPANY
573-575 Forest Avenue, Buffalo, N. Y.



KOTO TOP & CUSHION Dressing



COE-STAPLEY

Whirlwind
Tire Pump

The Heavy Nickel Handle Mounting

of "The Pump That Oils Itself"

Here again is liberal oversizing exhibited in the construction of this super-quality tire pump—just one of many points that have united to make it *the one best seller in the single pump field.*

The handle of the Whirlwind Pump is extra heavy, affording a good gripping area. It is handsomely mounted with nickel trimming, adding still further to the handsome appearance of the pump.

"The Mechanical Strength Exists Throughout"

The Whirlwind Tire Pump

Far-sighted Dealers aim to sell service. It pays in the holding of trade. Here, then, is a tire pump that has discarded primal design—and all of its back-breaking inefficiency. It stands today a model of ease of operation, long life, and faultless performance.

READ THE FACTS:

Self Lubricating—The "bucket" is always greased. It will not shrink, dry out or crack.
Heavy Base—This pump is "bottom heavy." It requires an effort to upset it. Foot holding space is ample.
Positive acting Ball Stop Valve.
Extra Strong Plunger Rod—This carries the "bucket" and lubrication receptacle.
Extra Heavy Nickel Mounted Handle.
Oversized Barrel, finished in gray baked enamel.
Best Quality Rubber Hose.

RETAIL PRICE $4.00

DEALERS—Every car owner who wants easy, rapid tire inflation done by a pump that will *last,* is a prospect for The Whirlwind Self Oiling Tire Pump—GET STARTED.

COE-STAPLEY MANUFACTURING CORP.

Factories, Bridgeport, Conn.

Executive Offices: 136 Liberty Street, New York

DEALERS
If **your** Jobber Perchance cannot give you the Details, we will furnish them.

Our Position In The Automotive Industry—And How It Was Attained

After several years' service, concentrated for the most part in the automotive industry, our position as a leading manufacturer of automotive forgings is now firmly established.

Many factors have entered into the building of Obenberger reputation. A thorough knowledge of forging practices and clean business methods, have done much to establish Obenberger reliability. A modern plant, splendid equipment and up-to-the-minute methods have also played their part.

A few facts concerning the Obenberger organization illustrate to what extent we can serve the industry.

—Our plant is running continuously—three shifts every twenty-four hours.

—Our 1920 business will be double that of 1919.

—We have a decided minimum of scrap or rejection which amounts to only ½ of 1%.

—Our record of delivery promises kept has been gratifying to our customers.

If you have need for drop forgings, or forgings hammered from billets, what we have to offer will be interesting to you. Write for details.

JOHN OBENBERGER FORGE CO.

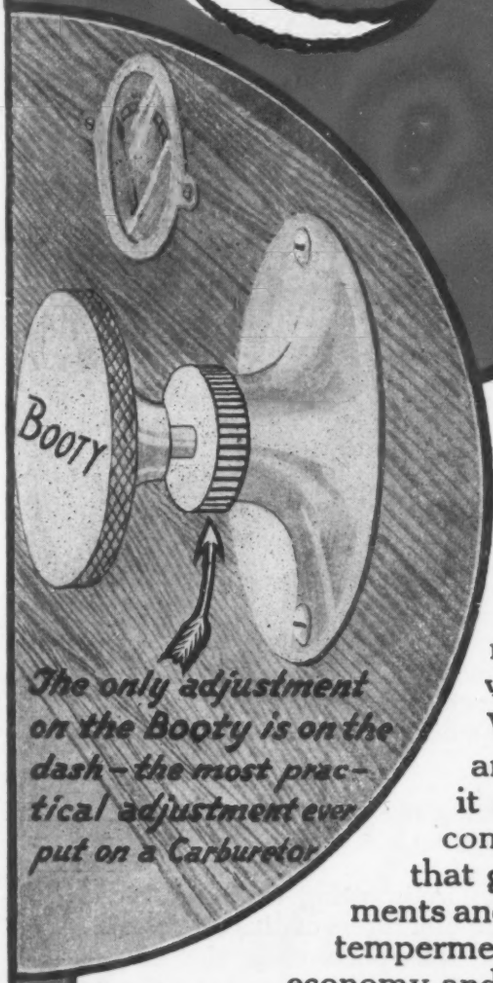
WEST ALLIS, WISCONSIN

Suburb of Milwaukee

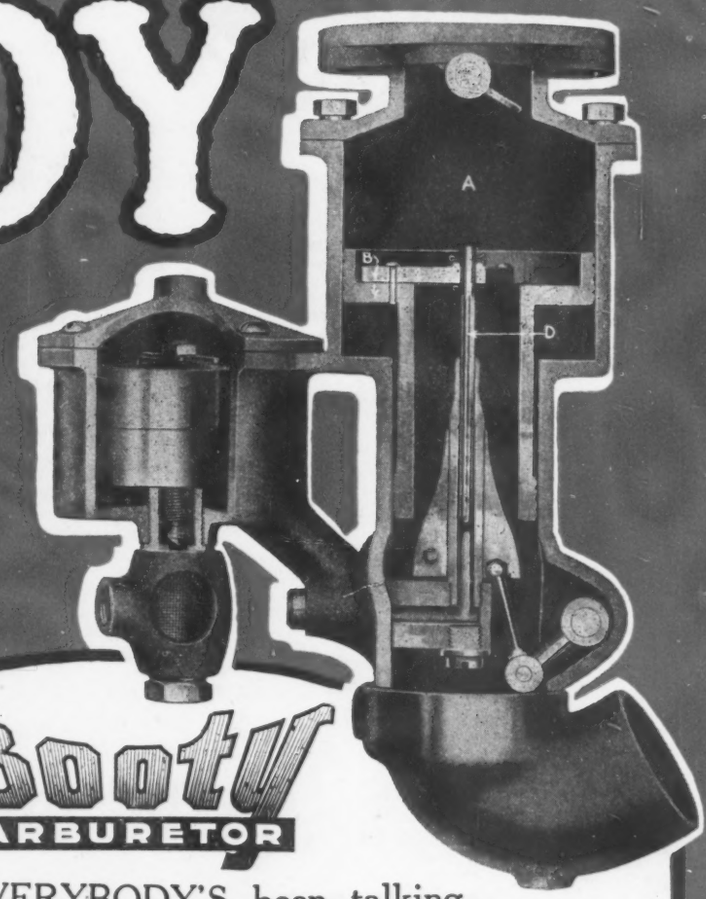
JOHN OBENBERGER FORGE CO. Obenberger Forgings MILWAUKEE WIS PLANT WEST ALLIS

THE MARK THAT STANDS for OBENBERGER SERVICE

READY



The only adjustment on the Booty is on the dash—the most practical adjustment ever put on a Carburetor



Booty
CARBURETOR

EVERYBODY'S been talking about this wonderful carburetor for months—the whole industry has wondered whether it was half as good as it was "touted."

Well, now it's ready—its been proved up—and you can see for yourself just how and why it solves every one of the problems that have come with low grade gas. It *is* the carburetor that gets clear away from the complicated adjustments and delicate parts that have made the best of 'em tempermental before. It *does* give more flexibility, economy and power than you ever thought possible. It don't load, choke or spit. The Booty is as good as they said it was and you can get in on the profits. See "Distributors Wanted."

Distributors Wanted.

We've got to build a huge sales and service organization overnight. That's why we have worked out an unusual sales plan with an unusual offer to **right sort of distributors.** Quick action on your part will get you a territory. Write—wire—or better still come in AT ONCE.

BOOTY CARBURETOR & MFG. CO.

21st and Wabash Ave., Chicago, Illinois

Booty Carburetor
21st & Wabash Ave., Chicago

I want to know more about your carburetor. Send me full particulars without obligation on my part.

Name .....

Street .....

City ....., State .....

I am interested as

Owner .....

Dealer .....

Distributor .....

BRANCHES

Atlanta
12-14 W. Harris St.

Boston
19-23 Jersey St.

Buffalo
1127-33 Main St.

Chicago
2715-17 Mich Ave.

Cleveland
1973 East 61st St.

Denver
1332-38 Acoma St.

Detroit
77-83 W. Willis Ave.

Indianapolis
1133 N. Meridian St.

Kansas City
1416 McGee St.

Los Angeles
1152 S. Grand Ave.

Minneapolis
10-12-14 S. 10th St.

New York
239-241 W. 56th St

Omaha
1806 Harney St.

Philadelphia
242-248 North Broad St.

San Francisco
Van Ness at Clay

Seattle
1708-10 Broadway

Toronto
88 Adelaide St., West

FACTORY PARTS AND SERVICE
Delco KLAXON REMY
AUTHORIZED BY UNITED MOTORS SERVICE

The Sign of an Authorized Distributor

Delco

KLAXON

REMY

Quicker and Better Electrical Service

At all United Motors Service Branches and Authorized Distributors, you receive *quicker* service on Delco, Klaxon or Remy equipment because complete stocks of genuine parts are always maintained.

And you receive *better* service because the parts are genuine—the service official.

And there is the added satisfaction in knowing that you are practically dealing direct with the manufacturers of this electrical equipment. United Motors Service Incorporated is the only authorized service department of The Dayton Engineering Laboratories Company, Dayton, Ohio, The Klaxon Company, Newark, N. J., and the Remy Electric Company, Anderson, Ind.

Send for Our Latest Organization List Which Will Give You Addresses of Our Authorized Distributors

MOTORS SERVICE TRADE MARK

UNITED MOTORS SERVICE INCORPORATED

GENERAL OFFICES, DETROIT, MICH.

A BRANCH OR DISTRIBUTOR IN OR NEAR YOUR CITY



An exclusive opportunity for tire distributors

An Exclusive Tire **An Exclusive Brand**
Exclusive Territory **Exclusive Profits**

And this opening is with an old established rubber company whose reputation as manufacturers

of high class rubber goods has been built on more than twenty years' experience. A company with ample resources, facilities and financial strength.

The line includes cord and fabric tires and grey and red tubes in all standard sizes. They have been thoroughly tried and tested over a long period in all parts of America as well as foreign countries and are now ready for quantity production. There are features of design and construction that are the sole property of the company. These products from the standpoint of quality and service have a peculiar distinction that merits the attention of the most prominent tire distributors and dealers.

Here is an opportunity to secure exclusive territory for a brand of tires that furnish sales argument with an irresistible punch. There is no indefiniteness in selling this line of tires, as to quality of the product or experience, ability and integrity of the makers.

Combined with a program of large production are aggressive sales and advertising plans, all in the hands of able executives, well known to the tire industry. This proposition creates a set of circumstances rarely if ever equalled in the rubber business. It is the sort of opportunity that appeals to men of red blood, who realize the tremendous possibilities of associating with an established organization at a period when plans for immense development are actually in the making.

The Company is now prepared to add to its organization at strategic points, exclusive distributors of force, tact and character, thoroughly alive to the sales opportunities offered and big and energetic enough to cash in on them. If you measure up it is a bona fide opportunity.

For perfectly legitimate business reasons the identity of the advertiser is not disclosed in this first announcement. But if you are willing to ally yourself with a business that is growing fast and is bound to develop still more rapidly—now is the time to act.

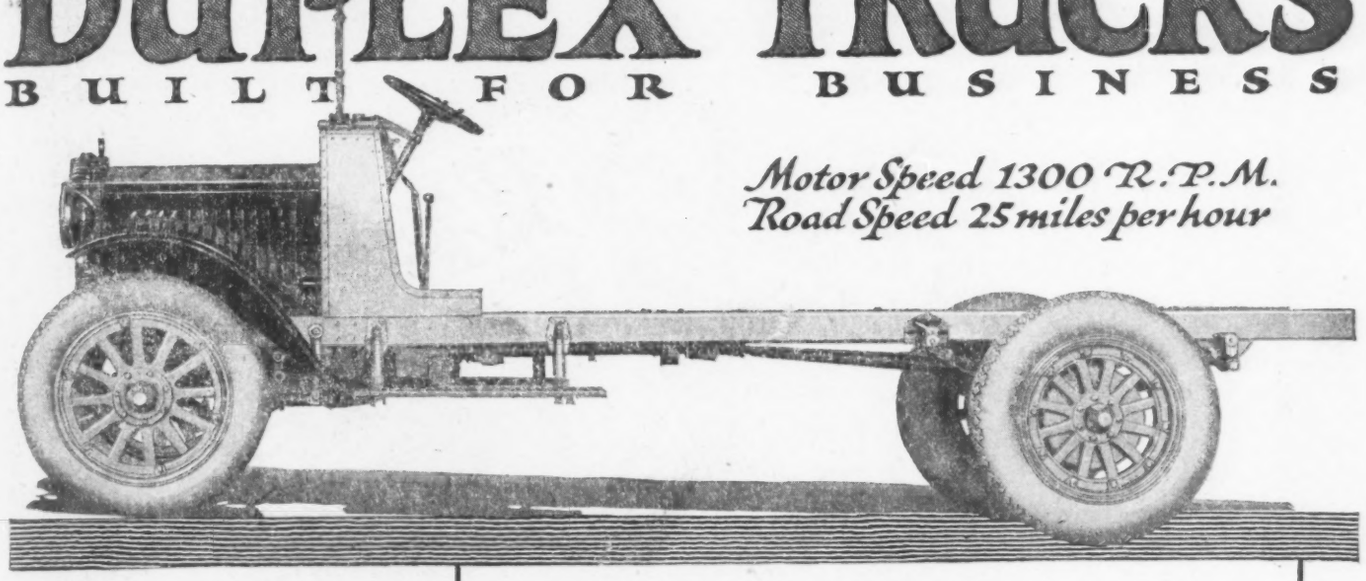
Write at once, giving an outline of your organization, facilities, your experience and the territory desired and you will receive full details of what is undoubtedly one of the most attractive distributing propositions in the tire business. All communications will be held in strictest confidence.

Address
TIRE MANUFACTURER
Care of CENTRAL SAVINGS & TRUST COMPANY
AKRON, OHIO

Note: The publishers of this magazine guarantee the authenticity of this advertisement and are familiar with the facts mentioned in it.

DUPLEX TRUCKS

BUILT FOR BUSINESS



Motor Speed 1300 R.P.M.
Road Speed 25 miles per hour

DUPLEX LIMITED

Specifications

Capacity: Normal Load 3000 lbs. Maximum allowable weight, including body, 5000 lbs.

Speed: 5 to 30 miles per hour on high speed. The Duplex **Limited** will attain and **hold** a speed of 25 miles per hour with a full load, and at **normal engine speed.**

Motor: 4 Cylinder enclosed type, water cooled. Cast enbloc. Bore 4", Stroke 5¼" 3 Point Suspension.

Clutch: Multiple Dry Disc. 5 plates—9" diam.

Transmission: Selective sliding gears—direct on high.

Electric Lighting and Starting: Westinghouse—with 157 am. hr. battery.

Carburetor: Stromberg 1¼".

Gasolene Tank: Under cowl—gravity feed. 18 gal. capacity.

Cooling: Special Duplex design Radiator with cast tanks and finned head. Spirex core, 18" fan driven by 2" leather belt. Centrifugal water pump.

Oiling: Force and splash feed.

Final Drive: Worm.

Front Axle: Drop Forge I-Beam 2⅛" deep.

Rear Axle: Straight or David Brown type of worm gear with 5.51 ratio.

Springs: Semi Elliptic—front and rear.

Wheels: Heavy Artillery type—12 spokes 1¾" square.

Tires: Pneumatic Cords 35 x 5 front; 38 x 7 rear.

Wheelbase: 145 inches.

Equipment: Windshield; Electric starting and lighting, Ammeter; Boyce Motometer; Speedometer; Electric Horn; Tools; Jack; Rim wrench. Front fenders; Alemite Grease Gun; Driver's seat without extra charge. (Power tire pump at extra charge.)

$2575

f.o.b. Lansing

Duplex Four-Wheel Drive

3½ Ton Capacity—$4250 f. o. b. Lansing

Here is the Duplex Limited—Medium Capacity—Two-Wheel Drive — Built in Response to Demand from Dealers and Users of the Famous Duplex Four-Wheel Drive

IT is a great *confident* public Good-Will and the assurance of real value in any truck that bears the name Duplex, that makes the Duplex Truck Company one of the oldest and most successful truck companies in America today.

It is this confidence and respect that resulted in an insistent demand for a medium capacity Duplex.

Now it is plain, of course, that it takes *merit in the trucks* to give the Duplex Truck so high a standing as that which it enjoys today.

Facts have a way of speaking for themselves. More and more there is a very definite tendency among *experienced* truck owners *to limit their selection to the Duplex.*

To all users of medium capacity trucks we can say, definitely, that this Duplex *Limited* is a Duplex through and through.

Strong, durable, well-built (and by an Organization that knows how to build well) the Duplex Limited is an unusually high standard investment for any man who wants value for his money.

Duplex Dealers are practical truck men. Ninety per cent of all the Duplex Dealers have been distributing Duplex Trucks ever since the Organization of the Company.

They are *established business men*—Their business is more and more successful. Their responsibility is unquestioned—Their future success is assured.

Naturally, the Duplex output this year is going to be allotted first to our present dealers. New Duplex Agencies are being more and more sought after and will be established as fast as the right men can be found.

It may be taken for granted that these agencies will be placed only with men of equal standing and business integrity as the present body of Duplex dealers.

DUPLEX
BUILT
FOR BUSINESS

Duplex Truck Company

Lansing · Michigan

One of the Oldest and Most Successful Truck Companies in America

THE stimulating force of public opinion, awakened to an intelligent knowledge of the value of Sheldon equipment by a campaign of widespread publicity, is a powerful factor in the mounting sales of Sheldon-equipped trucks.



THE SATURDAY EVENING POST

Sheldon Axle for Motor Trucks

The Long Leverage Principle is Employed to Carry the Freight Tonnage of the World

THE Sheldon Worm Gear Axle is built on the Locomotive Axle Principle.

It is a "live," load-carrying, revolving axle, with the wheels fixed to the axle, and the whole revolving as a unit.

The bearings are at hub and differential, giving the utmost leverage against side-strains.

Your motor-truck axle undergoes tremendous side-strain when turning a corner, running on a crowned road, skidding, hitting car tracks or the curb. Sheldon Axle Construction gives it the needed leverage and rigidity to stand the strain and to give long and economical service.

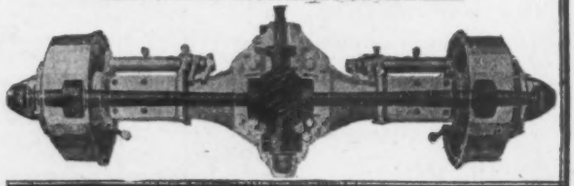
Sheldon Worm Gear Axles for motor trucks are built by the pioneer worm gear axle makers of the country. Their principle of ball thrust bearing eliminates lost power, minimizes friction, and requires no external adjustment.

It's the axle with the Torpedo Hub Cap and Double Anchor Trade-Mark. You can buy a Sheldon-equipped truck of any size from ½ ton to 5 ton and for any purpose. Before giving your order make certain that your truck is built with Sheldon Worm Gear Axles, for axle strength is the most important factor in truck construction and trucking performance.

Secure the facts—let us send you our booklet on Sheldon Worm Gear Axles. Write to

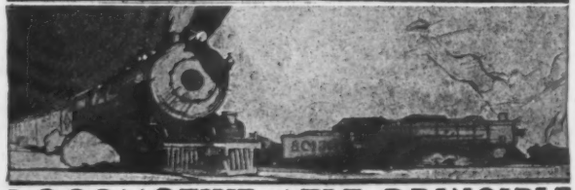
SHELDON AXLE & SPRING COMPANY, Wilkes-Barre, Pa.

Manufacturers of Sheldon Axles for Motor Trucks and Sheldon Springs for Trucks and Automobiles





SHELDON PRINCIPLE IS



LOCOMOTIVE AXLE PRINCIPLE


The Clear Ring of a Single Metal
STRIKE this bearing when suspended in mid air and the clear ring tells the story—a babbitt and bronze bearing, so perfectly united that it has the physical properties of a single metal.
The Stewart special process of metal cohesion has made this bearing possible—a bronze-back bearing having the strength and rigidity of a one-piece bearing.
The Stewart is the ideal bearing for automobile, motor truck, tractor and air craft engines, for electrical equipment and any machine requiring high-grade, smooth-running and long-lived bearings.
INSEPARABLE BRONZE-BACK BEARINGS
Stewart Mfg. Corporation
4500 Fullerton Avenue, Chicago
Stewart

SHALER

The Only Complete Line of

For Motorists' Use

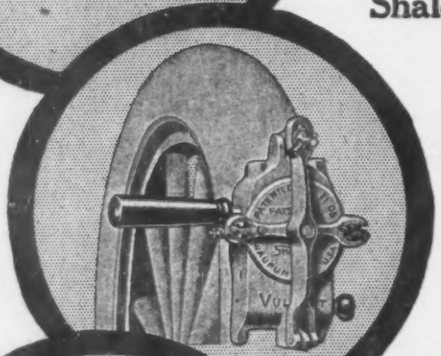
Shaler 5-Minute Tube Vulcanizer Complete Outfit with 12 Patch-&-Heat Units $1.50



Millions of motorists now carry this nationally-advertised vulcanizer in their cars for emergency tube repairs on the road. It makes a perfect, heat-welded, tube repair anywhere in 5 minutes.

The Patch-&-Heat Units which this vulcanizer uses contain all necessary rubber, dry fuel, etc. Each Unit is complete for a perfect repair. You just clamp it over the puncture and apply a match. In five minutes the repair is made. 12 Patch-&-Heat Units (6 Round and 6 Oblong) are included in every outfit. Additional Patch-&-Heat Units are sold by the dealer who sells the outfit. This gives him big continuous repeat-sale profits.

Shaler Vul-Kit For Tubes and Casings Complete Outfit With Repair Material $3.50



Makes one tire outlast two or three by sealing the small holes and cuts in the casing and preventing oil and water from reaching and rotting the fabric, and thereby ruining the tire. Every motorist needs this tire-saver to get the utmost mileage from his tires.

Fits every casing. No need of removing the tire from the wheel or deflating. Burns gasoline or alcohol in safe enclosed lamp. The SHALER Vul-Kit also mends every kind of tube cut or puncture.

Shaler Ford-Kit Complete Outfit With Repair Material $2.75



The SHALER Ford-Kit is similar to the Vul-Kit, but is specially designed for Ford tires. Mends both casings and tubes. Burns alcohol or gasoline in enclosed lamp. No dangerous exposed blaze, no loose fuel to spill. Works while the tire is on the wheel and fully inflated. The necessary repair material the motorist must use with these vulcanizers from time to time furnishes the dealers with continuous repeat-sale profits.

Ask Your Jobber

Every jobber the world over sells the complete line of SHALER Vulcanizers—because this is the only complete line of standard vulcanizers, nationally advertised, in big demand, and furnishes big repeat-sale profits for dealers. Write your jobber at once or place your order with him. Prices of SHALER Vulcanizers are slightly higher west of the Rockies and in Canada.

BUY FROM ANY JOBBER

VULCANIZERS

Standard Tire Vulcanizers

For Tire Repair Shops

Shaler 5-Minute Garage Tube Vulcanizer (Complete Outfit Subject to Trade Discount) **$10.00**

Quickly pays for itself. Uses the convenient Patch-&-Heat Units. Makes four repairs at one time—in only five minutes. Anyone can operate it—it is *safe*—automatically makes perfect repairs.

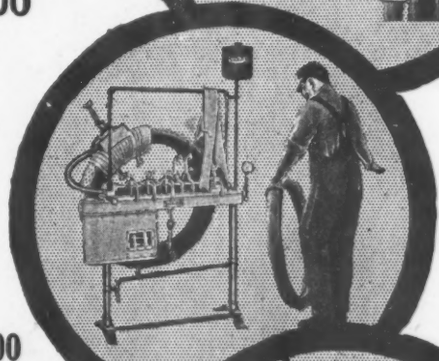
The outfit includes 28 Patch-&-Heat Units—enough to pay for the vulcanizer if you charge only 25c for each repair. Additional Patch-&-Heat Units are so low in price that this is the cheapest way to do tube repairing.

No Garage or Repair Shop can afford to be without this safe, quick tube vulcanizer.



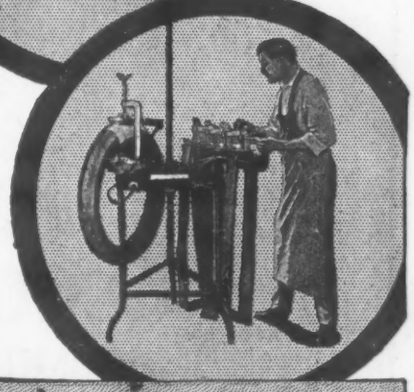
Type NPR Steam Shop Vulcanizer (Complete Plant Subject to Trade Discount) **$75.00**

Anybody can learn to operate this simple Shop Vulcanizer. Can be had either with gas or gasoline burners. Automatic Heat Control makes it safe. Makes every casing and tube repair that you care to make. Handles every size of tire, will vulcanize 1 casing and 6 tubes at one time, or 12 casings and 200 tubes a day. Uses the famous Wrapped-Tread method of repairing casings. Takes up little room and can be moved at will. Complete with full instructions.



Type ACE Electric Shop Vulcanizer (Complete Plant Subject to Trade Discount) **$75.00**

This model is the same as the NPR model described above, except that it operates by electricity, from city lighting current. Clean, practical and absolutely safe. Has automatic heat control. Uses little current, anybody can learn to operate it.



Write Us For Catalog

of the complete line of SHALER Vulcanizers for Motorists, Garages and Tire Repair Shops—steam, electric, gas, gasoline, alcohol and dry fuel types. Write at once for our free book, "How to Open a Tire Repair Shop."

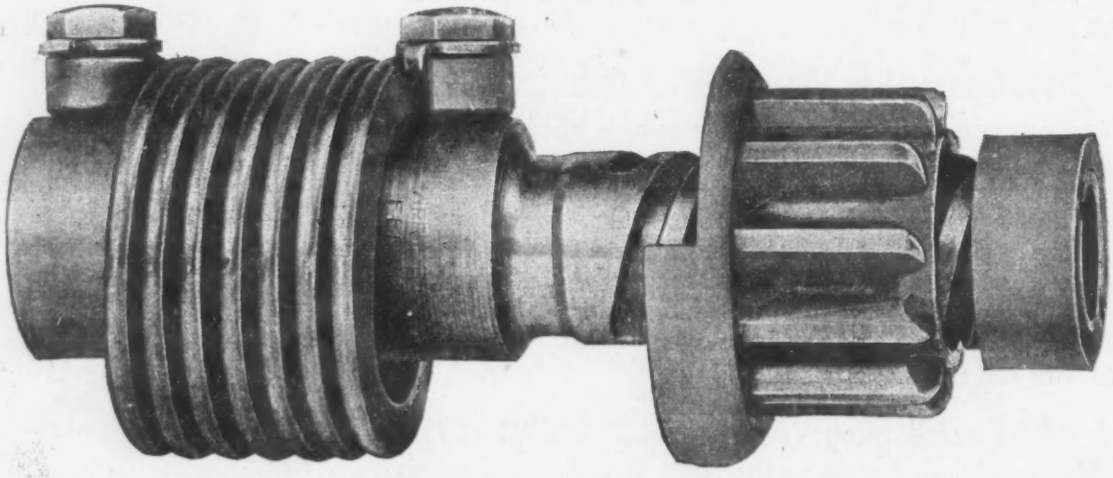
C. A. Shaler Co., 204 Fourth St., Waupun, Wis.

SOLD THE WORLD OVER

BENDIX ECLIPSE DRIVE

FOR ELECTRIC STARTERS

Automatic Engaging & Disengaging



194 Motor Car and Truck Builders Use It

Made by

ECLIPSE MACHINE CO.

ELMIRA, NEW YORK

If the Motor's a Wisconsin CONSISTENT It's a Good Truck

No truck is a dependable truck unless it has a good motor. Although it is possible to build an inferior truck around a good motor, to do so is not a wise policy. Hence, a *good* motor argues a *good* truck. Most men willingly pay a trifle more for a truck or tractor, if they *know* the motor is right. It is the wisdom of such far-sighted buyers that has made the

Wisconsin CONSISTENT

Motor the logical choice of manufacturers of the **better** motor vehicles.

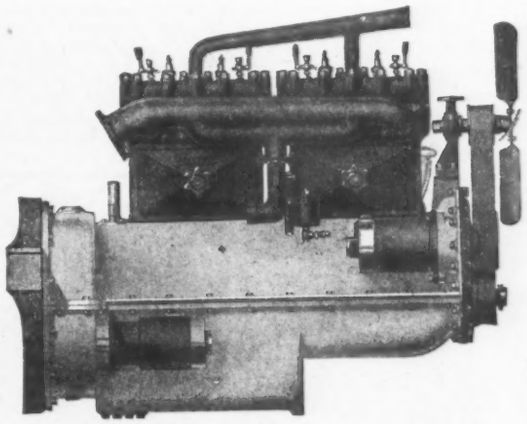
Wisconsin Motors are **ready to run** when they leave the shops. Every moving part is adjusted to the thousandth of an inch. Every bearing is run-in. Every motor is assembled, run-in, torn down and then reassembled and tested until it runs perfectly.

That's why manufacturers, dealers and users of Wisconsin-powered trucks and tractors have found that **it pays** to pay a trifle more at the start. They know that such a vehicle is more economical in the long run.

Our new booklet, "Honors Wisconsin Has Won," will interest you. Write for it.

WISCONSIN MOTOR MFG. CO.

Sta. A, Dept. 311, Milwaukee, Wisconsin



For Heavy-Duty Trucks and Tractors

Above is shown the Wisconsin Type RBU Motor, a super-powerful motor for heavy duty trucks and tractors. The Type RBU Motor has a 5-inch bore and a 6-inch stroke. Its horsepower is 50-plus. This motor, like all Wisconsin Motors, is tested for power by electric dynamometer.

The Denby Motor Truck Company, among many others, specifies this Wisconsin Motor for their big 7-ton trucks.

DISTRIBUTORS:

NEW YORK BRANCH: T. M. Fenner, Factory Representative, 21 Park Row, New York, N. Y.

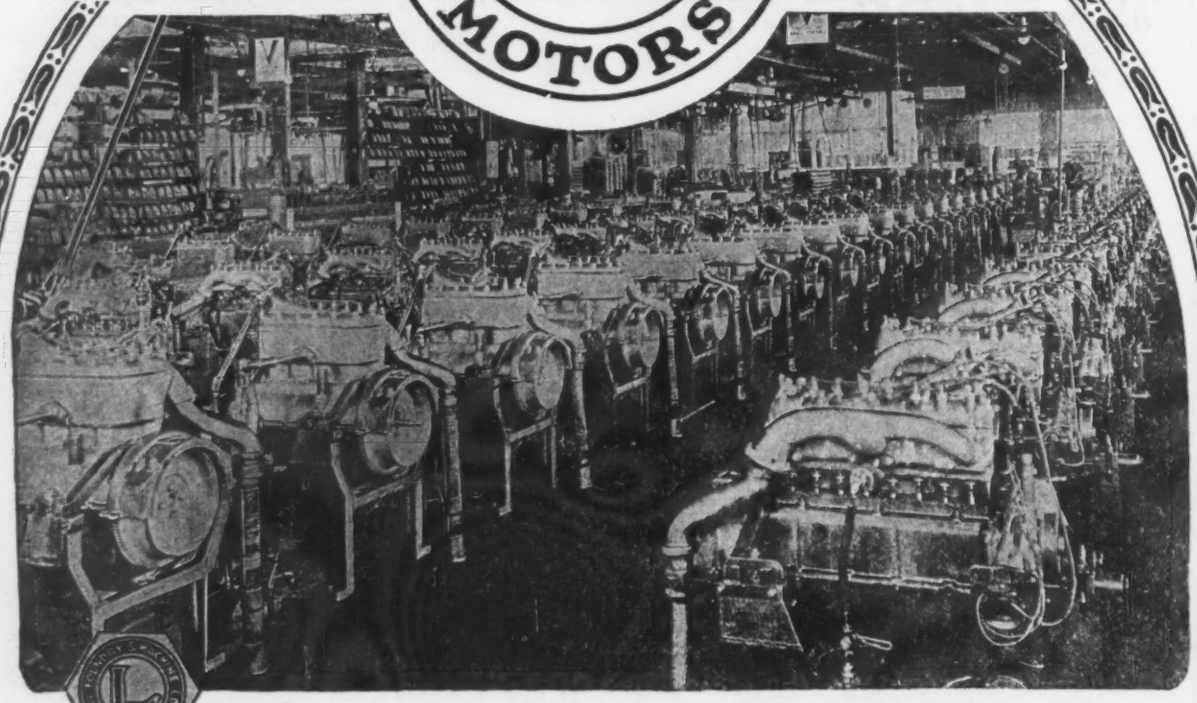
CALIFORNIA DISTRIBUTOR: Earl P. Cooper Co., Los Angeles, Cal.

NORTHWEST DISTRIBUTOR: Chandler-Dunlap Co., Seattle, Wash.

LYCOMING FOUNDRY & MACHINE CO. WILLIAMSPORT PENNA.

LYCOMING

MOTORS



Careful Engine Manufacture Means Minimum Repairs

Lycoming methods of manufacture involve the best quality metals, workmanship of the highest character, and the most thorough-going inspection and test. The result is an engine of the finest quality, of simple, powerful, efficient design, and with the ability to stand up well under the hardest service.

When a motorist buys a car equipped with a Lycoming Motor he has the surest guarantee obtainable of satisfactory performance. He will get out of his car all he can desire in the way of power and service. Lycoming methods of manufacture insure him a maximum of pleasure with a minimum of trouble and of upkeep expense.

Dealers will find it instructive to look up the service records of cars equipped with Lycoming Motors.

MODEL K:—4-cylinder, L-head, passenger car or light truck engine. Three point suspension. Bore 3½", stroke 5", S. A. E. h.p. 19.6, 35 B. H. P. at 2,000 R. P. M. S. A. E. Standard Flanges for two unit electrical system No. 2.

Lycoming Foundry & Machine Co.
Williamsport **Pa.**



THE MOTOR FOR THE DISCRIMINATING CAR BUILDER

Finch EXTENSION DOOR LATCH

PATENT PENDING

Actual Size

"It Fits the Ford"

ACT 1

(SCENE: Your store. Time: Present)

ENTER: Ford Owner.

F. O.: "B-r-r! Some cold! (Rubs hands.) Fingers about numb. Hurt 'em on that pesky door latch—trying to get door open."

YOU: "Noticed you fumbling with it. See those extension door latches? Fit right over those pesky little FORD latches; gives you leverage hold. Door opens instantly."

F. O.: "Great! Gimme a set. $2.00 you say? It's worth it in comfort and convenience. The folks 'll like 'em." (Exits.)

ACT 2

(SCENE: The same. Ten minutes later.)

ENTER: Another FORD Owner.

Second F. O.: (Drawing off gloves) "These gloves are a nuisance. Gotta take 'em off for everything."



YOU: "Even to find the door latches on your car, eh? Did you ever see these (etc., etc.)?

Second F. O.: "* * * Glad you spoke of 'em. It's one less occasion for lifting off my gloves. Made of aluminoid, eh * * * looks like nickel plate."

ACT 3

(SCENE: Morning train time at R.R. Sta.)

Second F. O.: "Say, Joe, what are those handles the wife said you're sporting on your car? She said they're some class. Where'd you get 'em?"

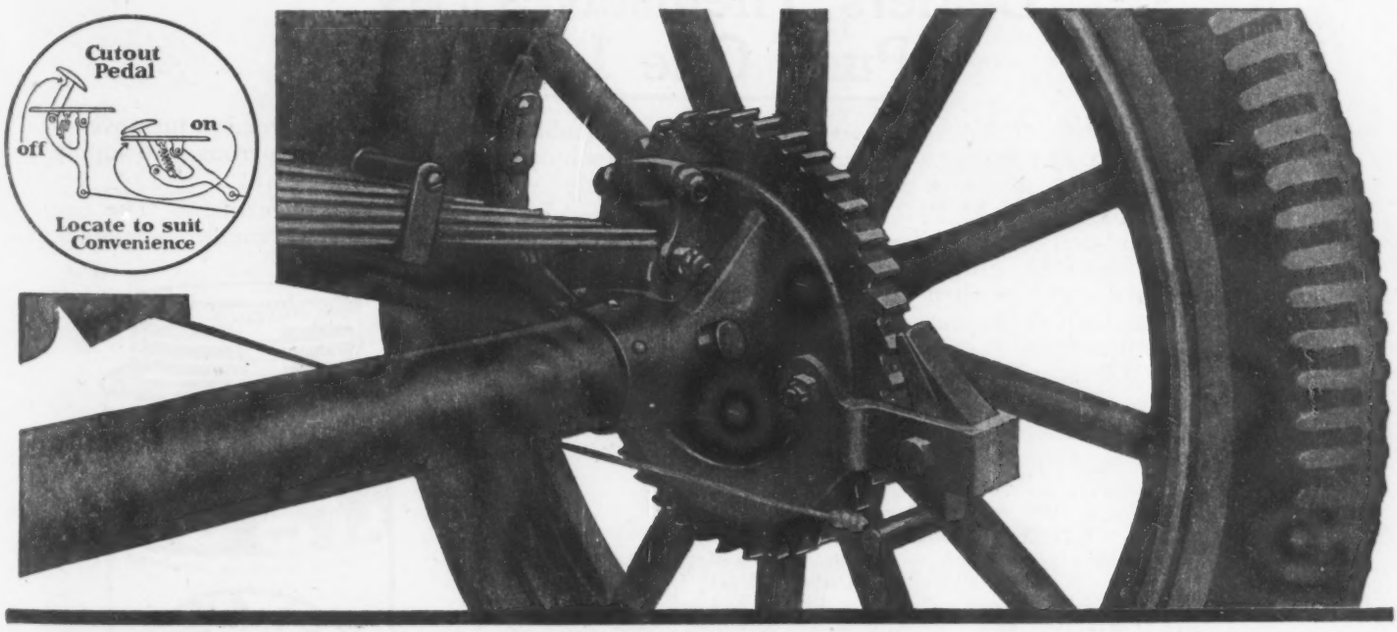
Third F. O.: "Over at (fill in your name here). They're mighty good for any kind of weather."

ENCORE

(SCENE: Your store. Time: later.)

ORDER CLERK: "Guess we'll have to send our jobber or those Wayland people another order. We're all sold out. Nifty little profit on those handles, I'll say!"





When your car stalls upon a steep hill and goes into a ditch, backs over an embankment or into someone's headlight, it may cost you more than the price of an Auto-Stop.

When you park your car on an incline against the curbing, the money you eventually pay for new tires would have paid for an Auto-Stop.

The time, money or labor spent for frequent brake adjustments because of the strain occasioned by leaving them set for any length of time could be more profitably spent for an Auto-Stop. Don't depend upon your brakes; depend upon an Auto-Stop.

The AUTO-STOP for FORDS

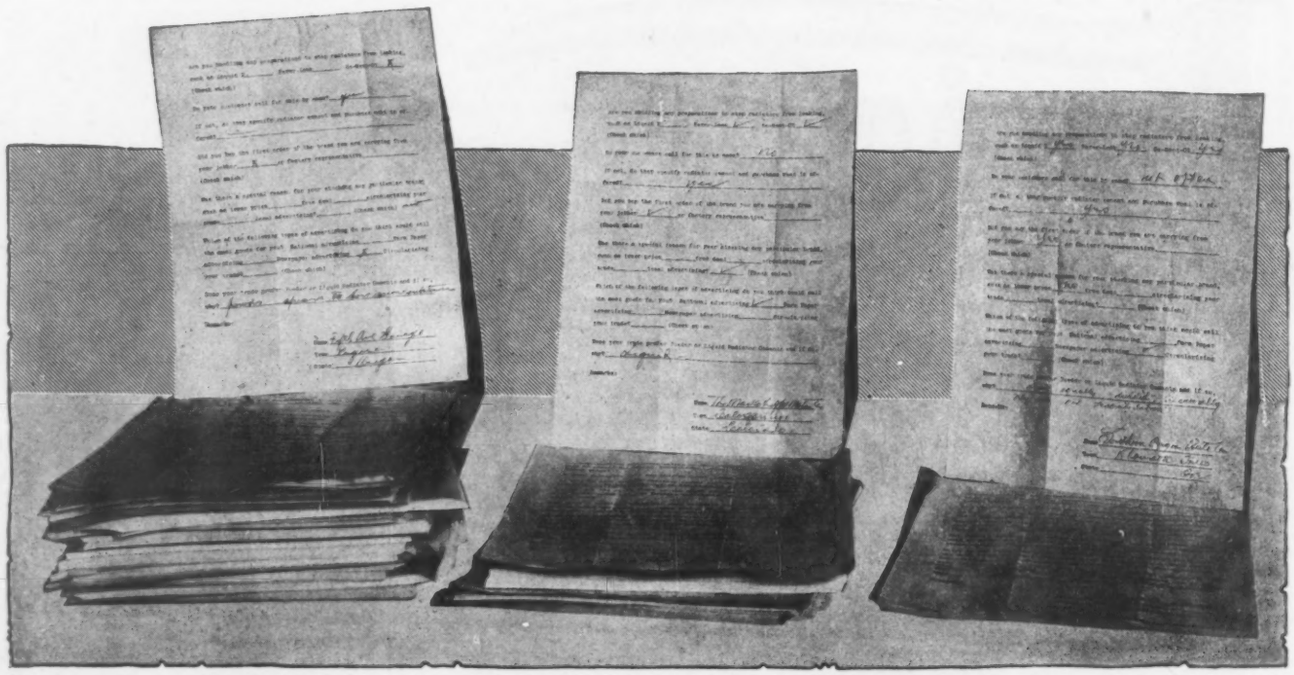
"You're Safe in its Grip"

Easily and quickly attached to rear wheel. Furnished with ratchet wheel mounted upon new brake drum. Bracket arm bolts on brake drum housing. Operated by driver, like a cutout. No wear; no adjustments. Use it thirty days; money back if not satisfied.

DEALERS and JOBBERS: Wayland Ford Specialties are quick and profitable sellers. New territory now being allotted. Ask us for detailed information.

Wayland Specialty Mfg. Co., INC., WAYLAND, N.Y.

Makers of the Auto-Stop, Finch Extension Door Latch, Wilkins Low Gear Control and other FORD accessories



The above dealers (nearly 500) say they carry one brand of radiator cement only.

The above dealers (approximately 150) say they carry two brands of radiator cement.

The above dealers (less than 50) say they carry three brands of radiator cement.

Dealers Themselves Say Push One Line

"Stock one good line only of radiator cement—duplicate stock doubles your investment—retards turn-over—does not pay." This is the aggregate advice to you from seven hundred of the most prosperous auto supply dealers in the country, as shown by a recent investigation.

The dealer who handles SE-MENT-OL exclusively can do business on a minimum investment. The one size can (75c Liquid or Powder) is large enough for any size cooling system—he has no cumbersome stock of varied size containers, his entire cost of doing business on this class of goods is minimized. The product itself he can back to the limit—SE-MENT-OL has been on the market for ten years and is the original—the recognized standard. Its very quality helps him to sell the rest of the Norwesco line of "Chemically Correct" products (see some of the leaders listed below).

If you wish to make the most of your chemical supply business, write us for special dealer proposition.

Attractive display stand free to dealers ordering two dozen cans SE-MENT-OL

OTHER NORWESCO PRODUCTS

Skalex, the Radiator Cleaner.
Top Dressings, Leather and Pantasote, and Mohair.
Rim and Gasket Shellac.
Utility Black, Quick Drying Enamel.
Valve Grinding Compound.

THE NORTHWESTERN CHEMICAL CO.,

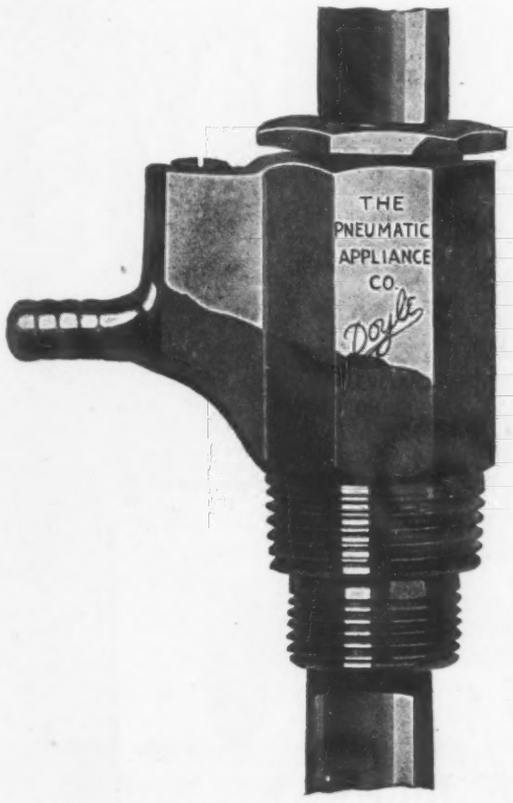
531 State St., Marietta, Ohio, U. S. A.

Canadian Factory: Montreal



SE-MENT-OL

The Radiator Repairer
Guaranteed for the Life of the Car



Pump Your Liquids by Compressed Air

HERE, at last, is a Compressed Air Pump that will successfully handle all kinds of liquids. Think of the time this will save you only in the handling of your oils. The DOYLE Pump will enable you to have your *oil supply at the curb,* together with your gasoline.

It is only necessary to insert the pump in the bung of the barrel, connect your compressed air and discharge lines to the pump, and turn on the air. The pump does the rest.

DOYLE Pumps will handle any liquid—from water to cup grease—and are at the present time successfully handling over a thousand different substances.

Doyle

JOBBERS—Write today for our attractive proposition—it's different.

If your Jobber cannot supply you, write direct.

THE PNEUMATIC APPLIANCE COMPANY
1151 WILLIAMSON BUILDING **CLEVELAND, OHIO**

AUTOMOTIVE TRAILER



"THE FREIGHT CAR OF THE HIGHWAY"

BUILT TO QUALIFY

AUTOMOTIVE ATC TRAILER

DISTINCTIVE FEATURES

Roller Bearing Turntable—Steel Wheels—Oilless Bushing
Standardized Construction

To the dealer of motor trucks who has made a study of commercial hauling conditions, the advantage of having exclusive selling rights on a complete line of Trailers is evident.

We offer to the distributor a very interesting co-operative sales plan. Full information on our product and selling plans will be given on request.

COMPLETE LINE

4 Wheel Semi Pole 2 Wheel

1 to 15 ton Capacity

AUTOMOTIVE TRAILER CORPORATION

GENERAL OFFICES
1442 McCormick Bldg.
Chicago, Ill.

FACTORY
Kincaid,
Ill.

Read this about this truck

THE roads it must travel and the loads it must transport are the two factors which determine the design of the Parker Truck.

Features founded on *facts*, not freaks put on for flimsy talking points, make the Parker fit for any road under full load.

The famous Wisconsin Motor, perfectly proportioned and with unending endurance, provides ample power, *all* of which is applied to drive whe ls through the Parker improved system of transmission.

Load strain and road stress are distributed *throughout* properly designed chassis, and the flexibility of the pressed steel frame, ball-and-socket radiator mounting, and extra long springs eliminate vibration and further decrease wear.

Rear axle strengthened for excess loads with radius rods relieving rear springs, makes a positive-tractioning, load-cushioning rear end.

That Parker features are sound from an engineering as well as a transportation standpoint is proven by the large number of Parker users among firms prominent in the automotive field.

Parker 4 Cylinder Trucks are made in 3 models - 2, 3½ and 5-ton.

Write for descriptive literature.

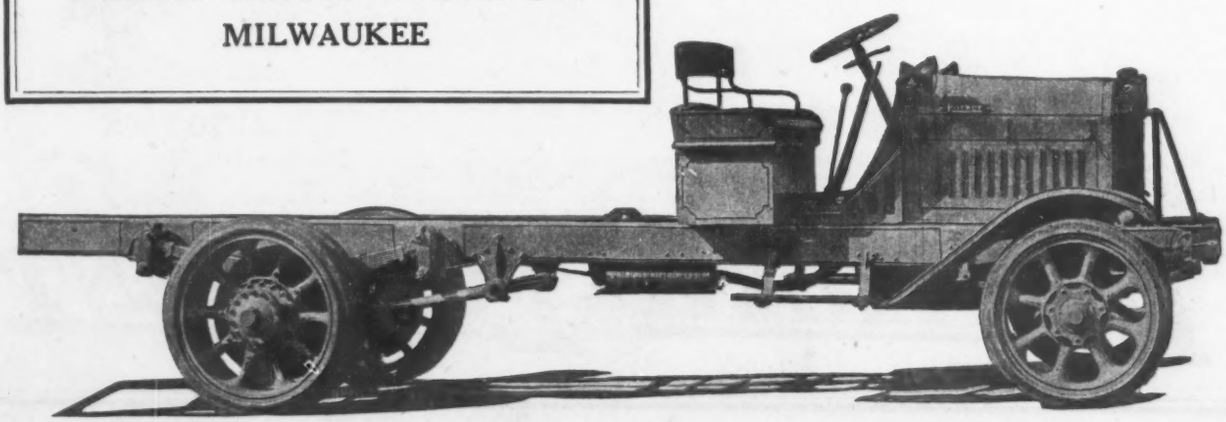
Parker Motor Truck Co.

MILWAUKEE

Parker TRUCKS

And Random List of Prominent Users

CUDAHY BROTHERS
STANDARD OIL CO.
WADHAMS OIL CO.
SCOTT & RICE CO.
STATE TRUCKING CO.
HARLEY-DAVIDSON MOTOR CO.
CHICAGO MOTOR DELIVERY CO.
MANDEL BROTHERS, CHICAGO
JOHN PRITZLAFF HARDWARE CO
RICHARDS FURNITURE CO.
BENESCH BROTHERS
THE ELECTRIC COMPANY, MILWAUKEE
BLUMENFELD-LOCHER CO.
TEWS LIME & CEMENT CO.
GOLL & FRANK COMPANY
INDEPENDENT MILWAUKEE BREWERY
C. NISS & SONS
MILWAUKEE VINEGAR CO.
NATIONAL DISTILLING CO.
NORTH SIDE LUMBER & FUEL CO.





Chicago Show--
Spaces 63-66



Take the Right Road at the Show

YEAR after year the most popular booths at every show are those that contain your old tried and true friends—the products that have weathered every storm of competition and time, and still remain the best investments that manufacturers, jobbers, dealers or consumers can make.

This year there is the same interesting and cordial welcome awaiting you at the Hartford Equipment booths. Three of your best friends—the Hartford Shock Absorber, Spring Bumper, and Auto Jack—will be there in 1920 styles of better values and better service.

It will be our pleasure to demonstrate why these accessories have won and held the leadership in their respective fields since the days of their introductions.

Automobile Manufacturers will find interesting and instructive data regarding initial equipment that protects and betters their cars. Jobbers and dealers will find old friends who have never failed to show a profitable year. Consumers will find accessories that are practically necessities in getting the best, most pleasing service out of their cars.

Hartford
SHOCK ABSORBER
"Makes Every Road a Boulevard"



SPRING BUMPER
The National Guard for Motor Cars



AUTO JACK
The Best Jack Money Can Buy

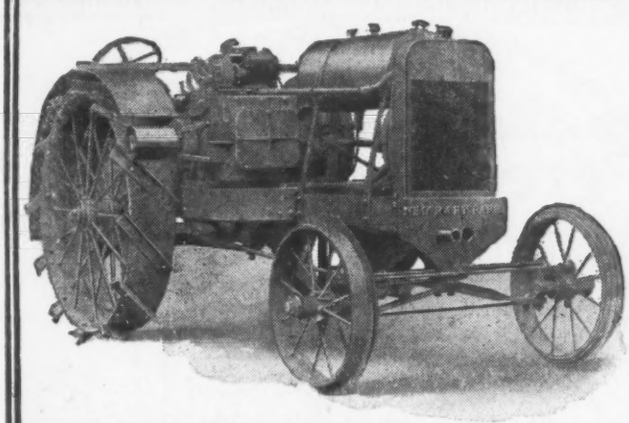
Remember—the Right Road at the Show—

Chicago—Spaces 63 & 66

Write the addresses in your note book—and come in for a chat

EDWARD V. HARTFORD, Inc., 35 Warren St., New York

Hartford EQUIPMENT



HART-PARR 30—Winning the Official Tests Today
Price $1395 f. o. b. Factory

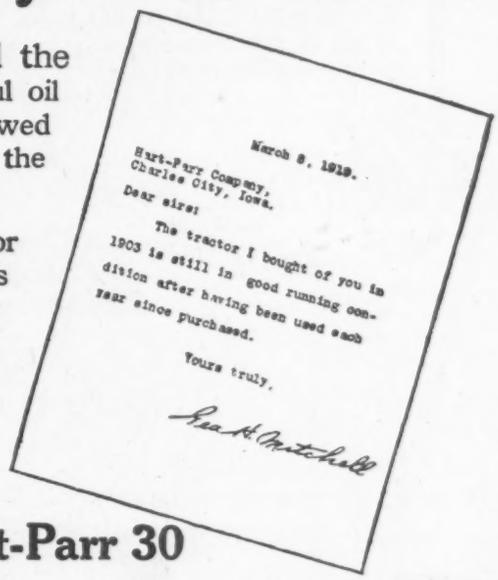


OLD HART-PARR No. 1
The First Successful Oil Tractor

The great grand-daddy of all tractors

Nineteen years ago Hart-Parr founded the tractor industry, building the first successful oil tractor. Many of the old Hart-Parrs that plowed the virgin Northwest prairies are working the same fields today.

Hart-Parr 30 today is winning official tractor horsepower tests throughout the country. It is the embodiment of wise construction resulting from nineteen years of tractor building experience. Our best salesmen are the owners of Hart-Parr 30 tractors. Hart-Parr performance in the field and Hart-Parr Aftersale Service keep them enthusiastic.



March 8, 1919.

Hart-Parr Company,
Charles City, Iowa.

Dear sirs:

The tractor I bought of you in 1903 is still in good running condition after having been used each year since purchased.

Yours truly,

Wm A Mitchell

Long-Life Features of the Hart-Parr 30

One piece cast steel frame, making an engine bed solid as concrete—no bend, no twist.

A two-cylinder twin motor—fewer parts to wear out.

A slow-speed motor—750 revolutions per minute.

Force feed fresh oil lubrication, that keeps fresh oil on bearings at all times.

All working parts easily accessible, making it easy to keep the tractor in adjustment and repair. The Hart-Parr 30 is obviously simple.

The Hart-Parr Aftersale Service that teaches the farmer to take good care of the tractor.

Sturdy construction that dates back to the old Hart-Parr 60's with a record for long life.

DEALERS *Write for our proposition and illustrated literature today.*

HART-PARR COMPANY
Founders of the Tractor Industry
207 Lawler Street, Charles City, Ia.

ABUNDANT POWER FOR THREE PLOWS. WEIGHS 5153 LBS.

HART-PARR 30

NINETEEN YEARS TRACTOR BUILDING EXPERIENCE

SD4

Kansas City's great annual

Auto-mobile show

Do you know

Kansas City is the capital of the largest high grade oil district in the world, providing 60 per cent of America's gasoline?

Kansas City is fifth in bank clearings?

Kansas City has more miles of parks and boulevards than any city in the United States?

Kansas City ranks third as a distributing center for motor cars?

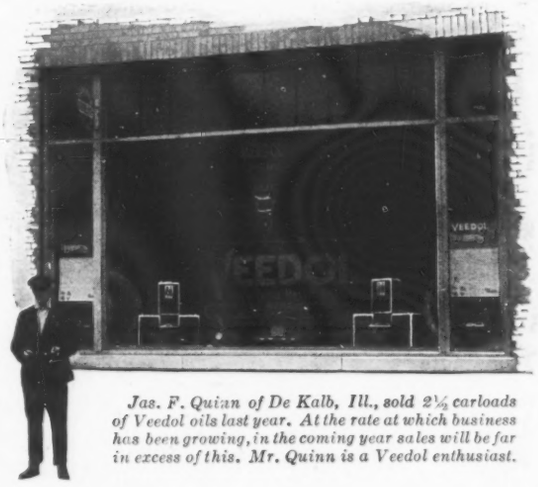
Jan. 31-
Feb. 7
Overland
Building



Kansas City
The heart of America

Seven dealers make more money from their oil sales

than most dealers make from their entire business



Jas. F. Quinn of De Kalb, Ill., sold 2½ carloads of Veedol oils last year. At the rate at which business has been growing, in the coming year sales will be far in excess of this. Mr. Quinn is a Veedol enthusiast.

HOW much profit can a dealer make from his oil sales?

Jacob Haines of Lancaster, Pa., sold in the past year $8,500 worth of Veedol alone. James Quinn sells over 2½ carloads a year in De Kalb, Ill. A. T. Smith of St. Johns, Mich., has had his sales jump from one barrel to a full carload in seven months—this in a town of only 4000. Harry B. Hartley of Boston doubles his oil sales in the first two months of business. Perry Hiatt of Woodland, Cal., and E. L. Shallcross of Middletown, Del., are equally successful. The Winerich Motor Sales Corporation have been handling sales of almost *a carload a month* in San Antonio, Texas.

See these men's pictures on the next pages.

The net profits from these sales of oil are more than many dealers net from their entire sale of accessories, repairs and storage. Yet not one of these dealers is doing a business which cannot be duplicated by men in cities of similar size.

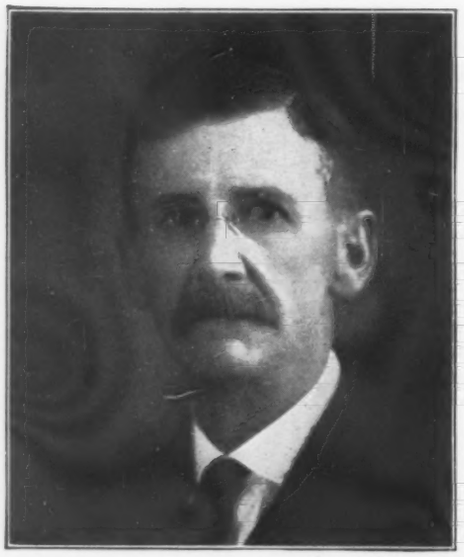
No greater capital is necessary. No extra expense is required.

How these dealers doubled their profits

What did these dealers do to increase their profits? They did not spend large sums for local advertising. They did not put in long hours canvassing or talking their oil. They followed a known business rule—a rule which has been worked out by successful dealers in every part of the United States in the garage trade, in hardware, in groceries and in general merchandising.

Each one of these dealers *specialized.* Many of them carry several kinds of oil. *Each one of them pushes one quality brand and builds up a following in his town.*

Each one of these dealers made a study of the oil proposition and came to the decision that his reputation for service—fair dealing at a fair profit with the giving of good advice—could be built up only with a quality oil.



St. Johns, Michigan, is a town of only 4,000 population, yet A. T. Smith has so far convinced his patrons of the merits of Veedol oils that his sales have mounted from one barrel to carload quantities in the space of seven months. Mr. Smith assumes responsibility for the tractors he sells only when Veedol is used as a lubricant.

What these six successful dealers



*Jacob Haines of Lancaster, Pa., sells $8,500 worth of Veedol oil in 12 months. "**Specialization**," says Mr. Haines, "builds business with a quality product like Veedol oils." Mr. Haines has amply proved this by doubling his business in two months.*

EACH one of these dealers stocked Veedol, the lubricant that resists heat. They put up the Veedol metal flange sign to attract trade. They asked for billboards for advertising Veedol locally. They sent Veedol scientific lubrication booklets out with their statements. They always advised the correct grade of Veedol, according to the lubrication chart, whenever a man bought oil. Some of them—not all, gave a little space in their local newspaper advertising to Veedol.

Backed up consumer advertising

In this way these successful dealers followed up the great Veedol advertising campaigns which are published in The Saturday Evening Post, Collier's, Literary Digest, Leslie's, Country Gentleman, Successful Farming and other papers. They let their customers know that Veedol could be purchased from them. They told customers that Veedol prevents 90% of engine trouble. They pointed out that it reduces by



*Harry B. Hartley began to sell Veedol only two years ago. His capital was limited but his faith in **specialization**—featuring only products of undoubted merit—has brought him substantial success. Mr. Hartley put out the Veedol sign. He talked Veedol continually to his customers — with the result that his sales increased 100 per cent in the first ten months.*

E. L. Shallcross of Middletown, Del., is another dealer who lays his success to ***specializing*** *on a quality product and using intelligent advertising to put it before his customers. "I haven't done a thing which any dealer couldn't do," Mr. Shallcross says, "Veedol advertisements do the work—I do mighty little."*



did to increase their profits

86% the black sediment formed in lubricating oil. *They taught their customers to drain out the old oil, rinse with kerosene and fill with the correct grade of Veedol.*

Little effort required

They have built for themselves a solid, enduring repeat business that eclipses the sales of tires and accessories, which last for only a year or for the life of the car.

These things which successful dealers have done *you can do* with little effort. You may not be able to double your business in three months, as many of these men did—it may take two years. But every month you will enjoy an increasing business, not only in Veedol oils and greases but also in everything you sell—from repair service to storage, from tires to electric bulbs.

The advertising helps which are furnished free to dealers and which are being used by these dealers are illustrated on the next page.



In Woodland, Cal., Perry Hiatt has built up a big business in Veedol oils. The demand for Veedol necessitates carload ordering, and Mr. Hiatt's sales now are increasing by leaps and bounds. Mr. Hiatt says his entire success is due to ***specialization.***



*Since the Winerich Motor Sales Co. (Mr. Winerich at right) started to push one product in each line in San Antonio, Texas, in 1915—they have sold "thousands of gallons of Veedol—****11 carloads in 12 months!****"*

Successful dealers use these advertising helps

TO SPECIALIZE on Veedol—to push it so that every particle of work done by the Veedol Company is effective for them, the seven dealers mentioned on the previous pages use Veedol advertising helps.

In the case of each one of these men the Veedol flange sign has a conspicuous place on the walls of his building.

The booklet on scientific lubrication is mailed by them with the monthly statements to hook up with the Veedol national advertising. The Veedol chart is on their walls so that their advice as to the grade of oil which should be used by new customers may always be correct.

Veedol electros are used by these dealers, who find that a little local newspaper advertising occasionally adds life and encourages the growth of the business.

All of these dealers' helps are provided. Over twenty thousand flange signs have already been sent out, most of them with original new orders from dealers.

Write for the Veedol proposition today.

You can build rapidly and surely by the same means which other dealers have used. No matter what the size of your business is it will pay you.

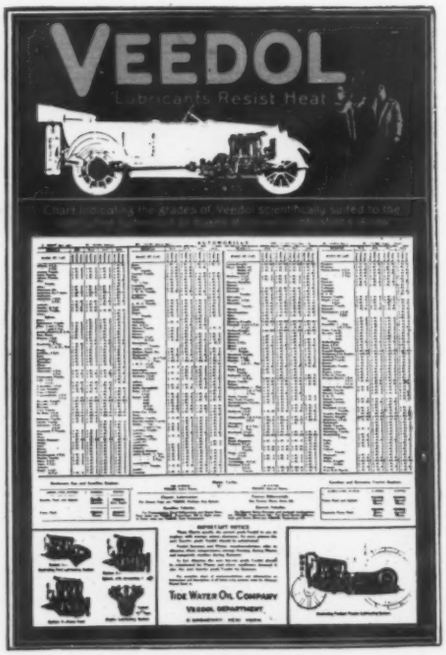
TIDE WATER OIL
Sales Corporation
General Offices: 11 Broadway, New York
Boston Chicago San Francisco Philadelphia



Cross section of an engine showing operating temperatures

"Out of oil again"

This booklet on Scientific Lubrication is one of the "helps" used so successfully by these prosperous dealers.



The Veedol chart shows the correct grade of oil for all cars and for the seven different lubrication systems, for aeroplanes, motorcycles, motor boats. Whatever car is to be served, whatever model, a glance at this chart makes certain that you can give the customer the best advice about his particular make.



The Veedol metal flange sign, supplied free to dealers, is 14" x 22". It is lithographed in fast orange and black colors; it stands out from the building so that the driver on the road can read it at a great distance.



STANDARD AUTO JACKS

Move Fast Through Your Stock

We have left no stone unturned in producing the best auto jack that man, money and machinery could design and produce.

And we have been successful. To-day STANDARD AUTO JACKS combine every desirable feature required of an auto jack — sturdy construction, simplicity, durability and appearance — at a fair price.

We are now in a position to offer **to you** — Mr. Dealer — a complete line of STANDARD AUTO JACKS for any car—for any purpose— a line which will sell on sight and earn big profits.

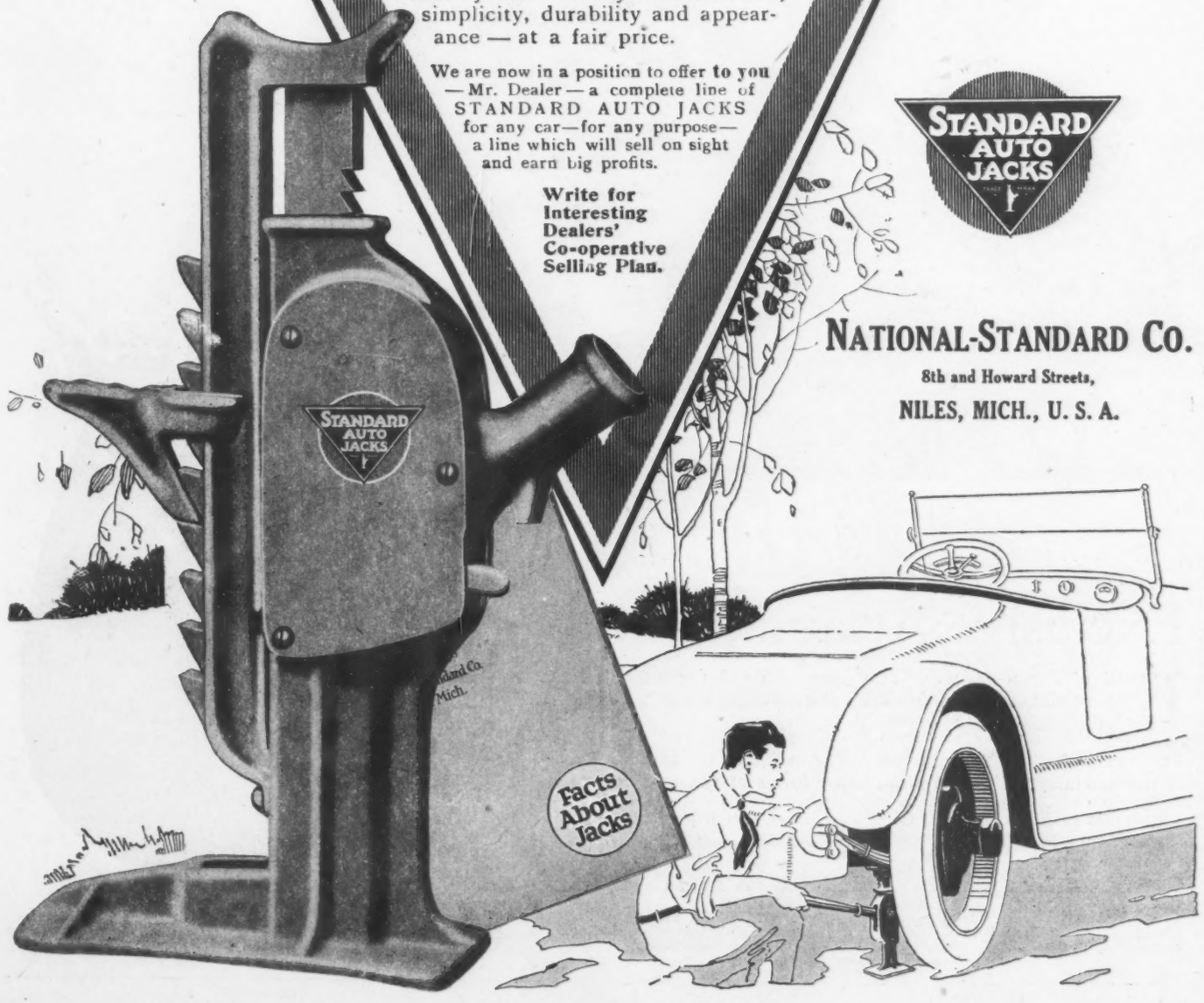
Write for Interesting Dealers' Co-operative Selling Plan.

STANDARD AUTO JACKS

NATIONAL-STANDARD CO.

8th and Howard Streets,

NILES, MICH., U. S. A.



FEDERAL

Double-Cable Base Tires



Exclusive Attainment

FOR quality and service attainment Federal tires always have stood as highly representative of the splendid institution behind them.

Their exclusive double-cable-base construction is the last word in tire economy and safety from many forms of tire trouble.

Federals make permanent friends of users which account for the fact that Federal Dealers are invariably successful.

All FEDERAL TIRES—"Rugged white tread (extra-ply fabric), "Traffik" and "Cord" black treads, have this exclusive construction.

THE FEDERAL RUBBER CO., of Illinois. Factories, Cudahy, Wis.
Manufacturers of Federal Automobile Tires, Tubes & Sund. Motorcycle, Bicycle & Carriage Tires, Rubber Heels, Fibre Soles, Horse Shoe Pads, Rubber Matting & Mech. Rubber Goods.

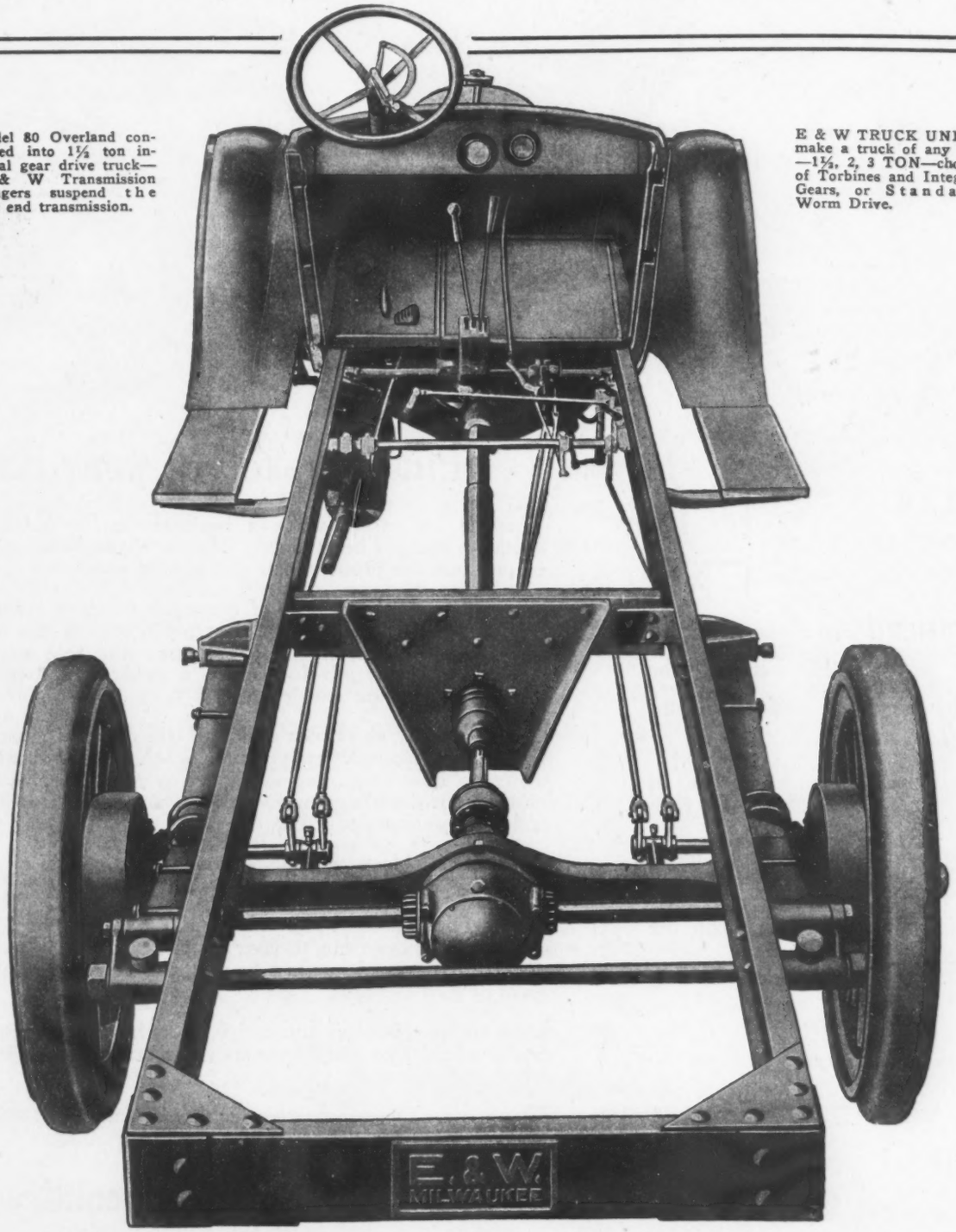
Building Passenger Cars Into Trucks the E. & W. Way

E & W TRUCK UNITS are designed from an engineering standpoint, and built by standardized automobile manufacturing methods. With any make and model passenger car, they form, not patchy repair-shop jobs, but well-built, money-saving, economically, easily driven, **100 per cent trucks.** Make an up-to-date truck out of any passenger car the E & W way, with E & W TRUCK UNITS. Cash in on the new use for used cars.

SEE E. & W. TRUCK BUILT PLEASURE CAR CHASSIS BELOW — SEND FOR FULLY DESCRIPTIVE LITERATURE

E. & W. Manufacturing Co. Milwaukee, U. S. A.

Model 80 Overland converted into 1½ ton integral gear drive truck—E & W Transmission Hangers suspend the rear end transmission.



E & W TRUCK UNITS make a truck of any car —1½, 2, 3 TON—choice of Torbines and Integral Gears, or Standard Worm Drive.

Bring your Shop Into your Office



Put it on top of your desk

THERE are three important parts of your business—the shop, the office and the bank balance.

The money is made, or lost, in the shop.

But the third part of your business, the whole object of the business, the bank balance, depends upon the office.

The day has passed when a business can be operated without adequate records being kept. That is if the business is expected to produce the profit it can and should produce.

Without complete records of every job, of every transaction, you cannot know what any particular job is costing you, whether you are making money or losing money on that particular job. And, unless every job does make a profit, you are not making the money you are entitled to.

Can you today sit at your desk and tell, not guess, just how much work your shop is doing, how much each job is costing in labor and materials, how much you are going to get for each job and how much profit you are going to make on each job after labor, materials and overhead are deducted?

Without these facts you are operating your business on a dangerous basis. And you can have these facts.

Comfort Standardized Tags and Forms for automobile dealers, repair shops and garages bring to your desk in complete, yet simple, form the cost facts that you must have if you are to stop-up the profit leaks of your business.

Over twelve thousand automobile men have found that Comfort Standardized Tags and Forms are as necessary in their business as is labor and material.

They are worth investigating because they increase profit. Send the coupon today.

COMFORT PRINTING SPECIALTY CO.
101 North Eighth St., St. Louis, Mo.

Please send me catalog of the Comfort Standardized Automobile Tags and Forms.

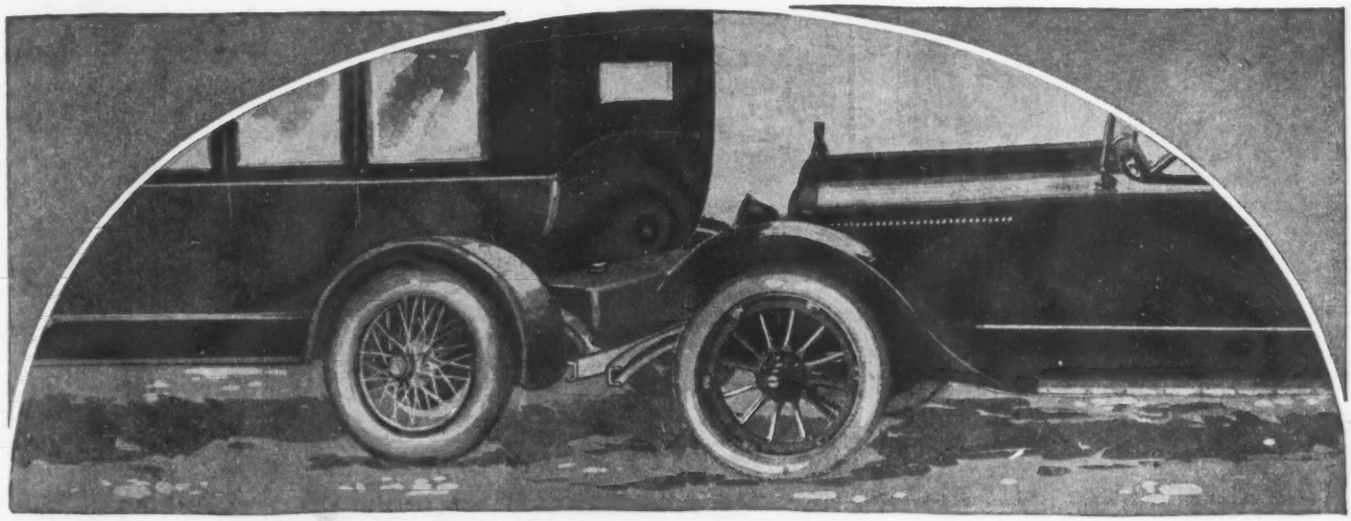
Name .....

Street .....

Town ..... State .....

Comfort Printing Specialty Co.

101 N. Eighth St. Saint Louis, Mo.



"And It Never Scratched a Bit"

The Bumper upon your car is a concrete application of the principle of **protection**; protection in garage; protection fore and aft in crowded streets, when traffic ebbs and flows,—and where sudden stopping or starting means trouble.

Why do most taxicabs use Bumpers, both fore and aft? Because they want to **save their cars;** and taxicab drivers, as a rule, are the most expert men that drive. They learn the ins and outs by experience. Hence, they use Bumpers.

The Badger line of Bumpers is **best for the dealer**—only four styles needed to equip 80% of all cars driven. A Badger Bumper is **best for the car**—it fits so securely it is proof against straining; it is so staunchly constructed it will withstand most severe service; such great pains is taken in nickel plating we guarantee it against rust for one year. And it possesses beauty and style, improving the appearance of any car.

They are priced **right** to the Dealer. He can price them right to the Buyer. They "show" well, they move quickly, they make friends wherever they are sold.

And this is preeminently true of the entire line of Badger Accessories. Dealers call them "Necessories."

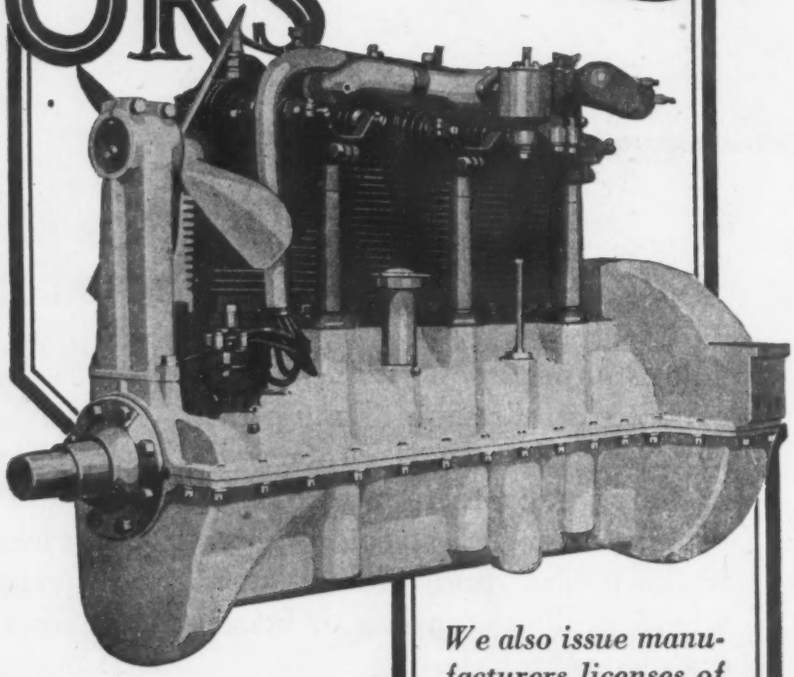
Let us send our illustrated Catalog

The Badger Mfg. Corporation

(The House That Has the Goods)

Milwaukee, Wisconsin

CAMERON AIR-COOLED PATENTED MOTORS



It Is The Cameron Design That Makes Air Cooling a Successfully Accomplished Fact--This Step Marks an Evolution in Motor Development

PERFECT heat radiation through the medium of air calls for changes in formal engine design, as attempts to accomplish this through the installation of flanges on water-cooled types have never met with success.

Cameron Motors have inlet and exhaust valves set exactly opposite. The cool charge from the carburetor impinges directly on the exhaust valve where greatest heat develops, keeping it perfectly cool. A plain, smooth cylinder head interior permits larger valves, giving maximum full and free passage to incoming and outgoing gases. The valve operating mechanism is an engineering revelation.

And so we have here a motor designed to cool. Ample flanges on cylinders and valve cages swept by a great volume of air sent in by an "aeroplane propellor bladed" fan completes the Cameron Cooling System.

Here is heat radiation pre-determined and constant, unaffected by the various changing conditions that make water cooling unstable, unsatisfactory and sometimes dangerous to engine life.

We also issue manufacturers licenses of our Patents covering the following bore and stroke ratios:

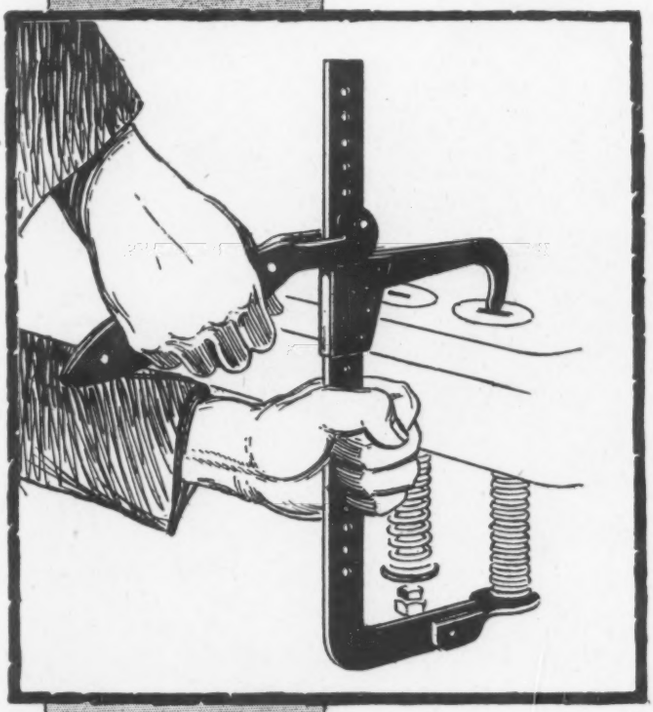
2½ x 4
3x4½
3½ x 5
4 x 5½
4⅝ x 5½
4¼ x 6

Our brochure is complete in detail

OUR MANUFACTURING FACILITIES WILL INSURE PROMPT DELIVERY ON QUANTITY ORDERS, BOTH LARGE AND SMALL.

CAMERON MOTORS CORPORATION 2 Columbus Circle :: NEW YORK CITY

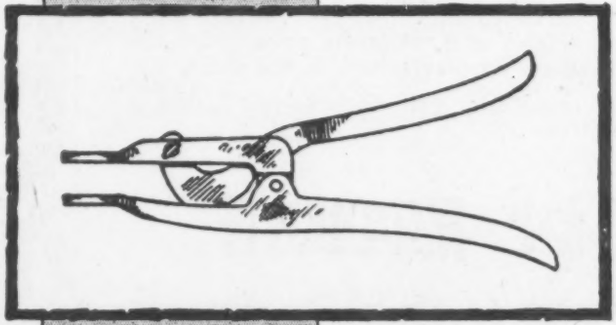
T & L Valve Lifter Means Speed In Taking Out Valves



And speed and quality of work are the two factors that count most in any repair work. Your repair profits are in a large part governed by the time the work takes your mechanic. And T & L Valve Lifters cut the working time. So they boost your profits.

OPERATES BY A SIMPLE CAM ACTION

And there are no springs or catches to get out of order and cause trouble. Made in two models, the larger is for use on ALL cars, tractors, trucks and in general shop work—in removing valves from all T & L Head motors; the smaller especially adapted to all small cars. Prices—larger model $2.25; smaller model $0.75. If your jobber cannot supply you with T & L Valve Lifters send us his name and the coupon below and we will tell you the nearest jobber who handles them.



The Only Grease Gun Company,
Jefferson, Iowa.

Gentlemen:

Kindly furnish us with the name of our nearest jobber who handles your T & L Valve Lifters.

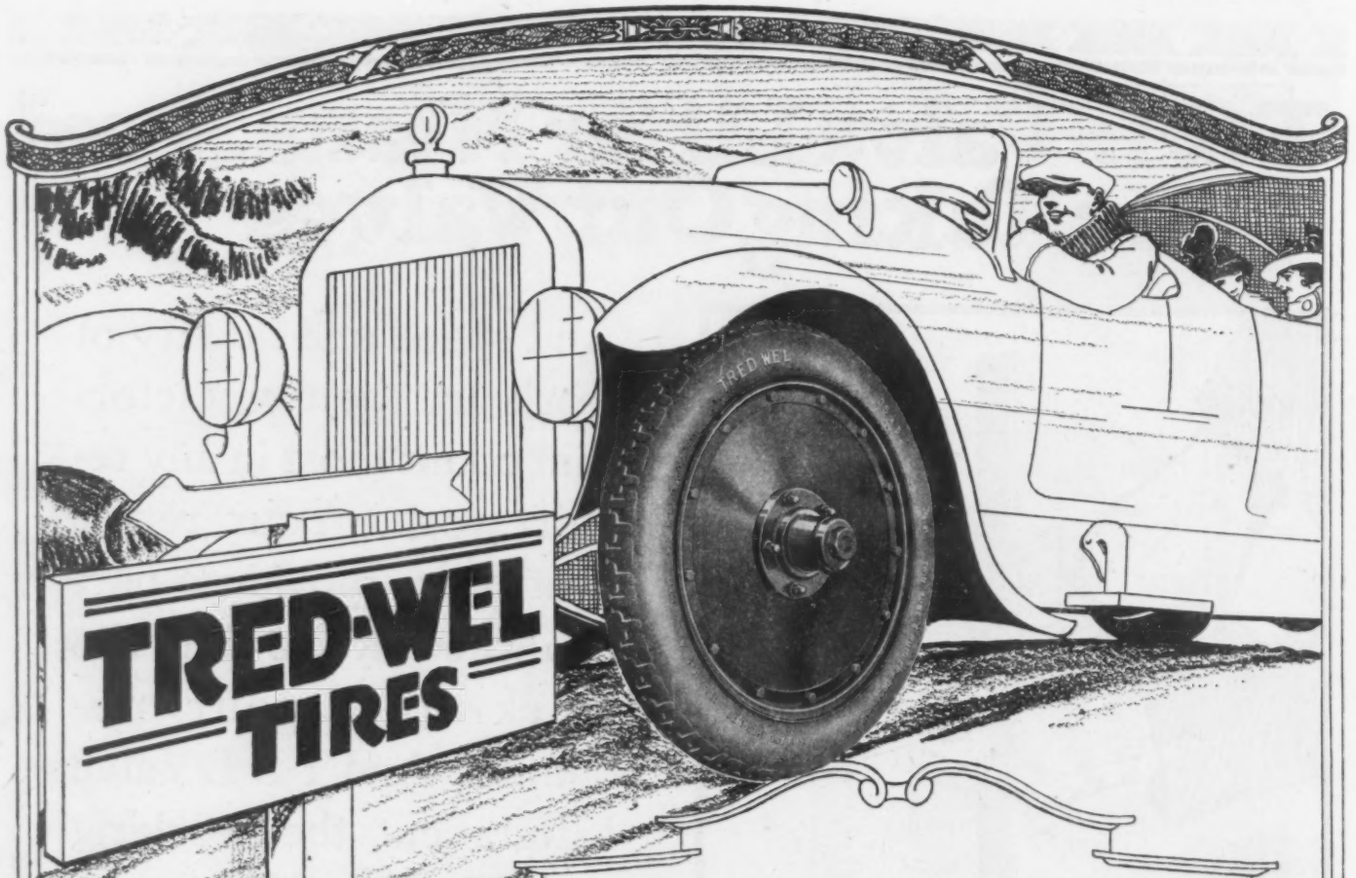
Our Jobber's name is.....

Name .....

Address .....

The ONLY Grease Gun Company

JEFFERSON, IOWA



When a Driver Puts the Dealer's Word to the Test

In your store a man often takes your word for the quality of a tire. He has enough confidence in you to bank on what you tell him.

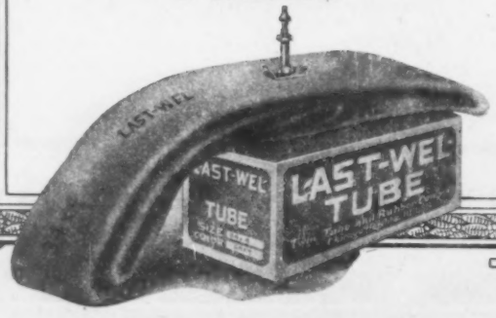
But out on the road, under normal and abnormal conditions, he puts the tire to a real test.

A good, strong sales talk can put a tire on a car, but it has nothing to do with putting on the second one. The tire itself decides that. A tire may look ***right*** in the store, but act ***wrong*** on the road. And if it does you have lost your customer's confidence and, the chances are, his future trade.

Why not begin selling tires like Tred-Wels—quality tires selling at a moderate price? On the road they back up your sales talk in the store.

Write for our dealer proposition—you'll find it different.

LAST-WEL TUBES



TWIN TUBE AND RUBBER CO

Address Sales Dept., 1002 S. Michigan Ave., Chicago, USA

Factory and General Offices, Chicago Heights, Ill.



THE Crane Puller gives full value because of its general utility, rather than for the single, difficult job.

Every service station man and every garage owner will testify that he wouldn't be without a Crane Puller for the good and sufficient reason that he never knows just when a job is coming in when he will need this tool and need it quick.

For removing auto wheels, cams, collars, commutators, fly-wheels, gears, propellers, sprockets, pulleys, ball bearings and annular bearings, etc., etc.,—there isn't a tool made that will do the work as quickly as the Crane Puller.

Made of the best materials with improved locking arms, locking screw and gear beveled head.

The three-arm puller illustrated is available with two different size adjustable arms.
All Crane Pullers Absolutely Guaranteed. Every dealer should be in a position to supply this tool to his garage and service station customers. Jobbers' salesmen should carry it as a specialty.

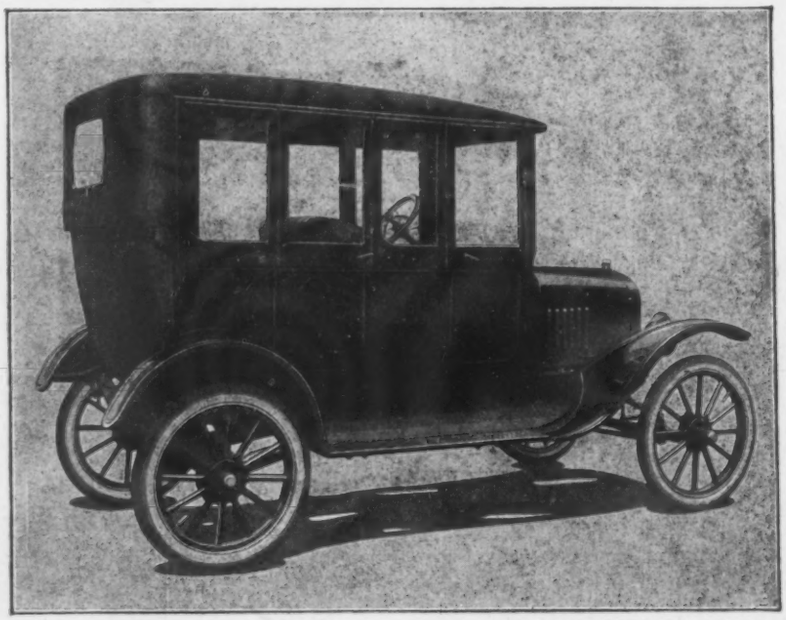
Write for descriptive folder and discounts

Crane Puller Co., Arlington, Mass.

When You Think of Puller—Say

CRANE PULLER

We Make Prompt Deliveries



DEALERS—Consider the importance at this time of the year, of getting your winter tops **promptly** when you order them.

That's the way MILLER Tops come—while your customers want them most.

DEALERS—Look ahead at what's to come this winter. Two of the worst months of the year—February and March—the months of coldest weather, and winds.

Then, with your mind on a thermometer around zero, and 45-mile-an-hour gales, think of the tremendous possibilities for mid-winter sales of

MILLER *Ideal* Enclosed Tops for Fords

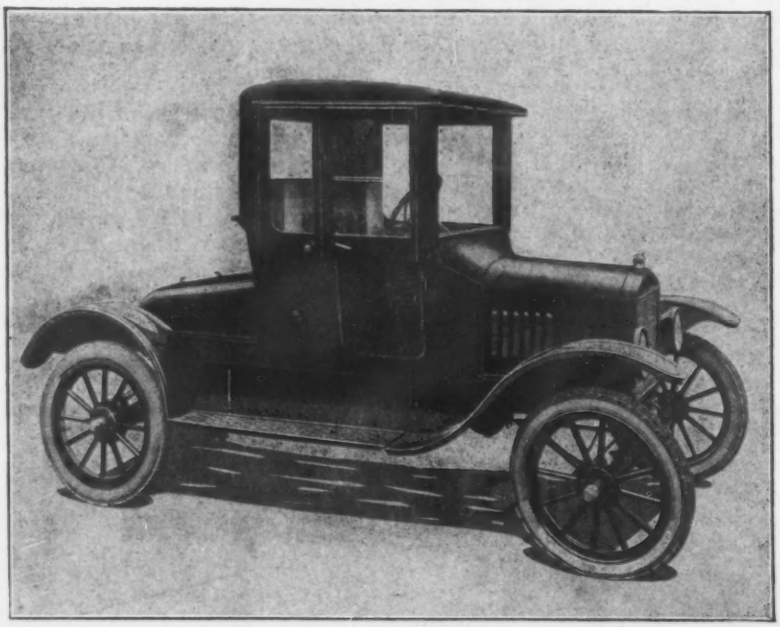
The season for them has just begun. Cold noses and frosted hands bring in new customers for them every day. And then consider their period of usefulness. Look at April and May with their rains. It's just as important to have a limousine top to be comfortable in rainy SPRING weather, as it is to have one for warmth in Winter.

MILLER Tops still have FOUR MONTHS OF THEIR BIGGEST SEASON left—and lots of owners use them ALL YEAR 'ROUND—without the windows in summer time.
Let's talk about this. There are some good profits in it for you.

Wire, write or come to Caro today.

Miller Top & Body Manufacturing Company
Caro, Michigan

All wood used in Miller Ideal Enclosed Tops is of seasoned selected hard wood. The top has six bows, eighteen slats and solid back.

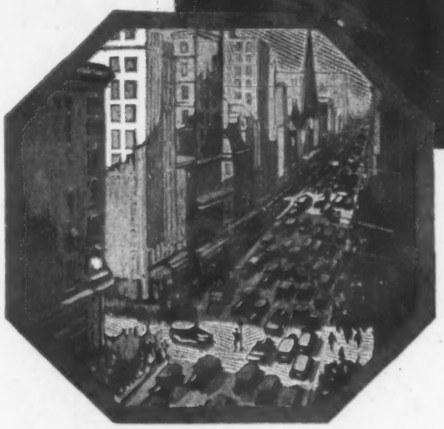


Every joint and slat in Miller Ideal Enclosed Tops is separately glued, nailed and screwed. Top is "Neverleak." Windows are extra heavy clear-vision Crystal glass.

MILLER Ideal Enclosed Tops Are QUALITY clear Through.

Columbia Six





A Car of Poise

The charm of perfect poise! You will recognize it instantly in Columbia Six enclosed models.

How we admire it in an individual! That assured, confident appearance which distinguishes the business leader from the failure—the successful debutante from her boarding school sister.

Today with the motor car playing such an intimate part in every activity the confidence that springs from owning a "correct" car is fully as vital to business or social success as that which comes from faultless clothes.

"Perfect poise" well expresses the looks and actions of the Columbia Six.

The artistic moulding of the body lines—the richness and perfect harmony of the furnishings and fittings—the responsiveness and thorough dependability of the car—the knowledge that every mechanical part will function promptly and correctly at any time in any weather—these give to the Columbia Six and to the Columbia owner real poise—a sense of correctness and fitness for even the most distinguished occasion or company, that is a source of lasting delight.

Poise has been achieved in the Columbia as in an individual, by careful study to perfect each detail—both of appearance and of basic character.

Columbia Dealer's Records Reflect Columbia's Poise

Just as the poise of a person comes with the elimination of imperfections—so the poise of the Columbia Six is evident and lasting because of its freedom from embarrassing imperfections.

Naturally, a car that eliminates most of the troubles of motor car driving is a car that is much desired.

The records of Columbia Six dealers substantiate this fact.

If you are building for a permanent and increasingly profitable business, we shall be glad to review some of the Columbia dealers' with you.

COLUMBIA MOTORS COMPANY
DETROIT
U. S. A.

Gem of the Highway

COLUMBIA SIX



The COFFIELD TIRE PROTECTOR makes- any tire wear longer

This Protector will make any tire deliver miles upon miles of greater service and longer wear than it otherwise would. Backing up the casing against stone bruises and all shocks of the road, the Protector keeps the fabric from breaking, reduces blowouts to a minimum—and in this way produces full wear from the casing.

The Coffield Protector is made of pure, live rubber and contains absolutely no fabric—as a result of which there is absolutely no friction between the protector and either the tube or the casing. The first cost of Coffield Protectors is the only cost as they do not wear out with the tire and can be used over and over again. The Protector will pay for itself on the first tire in which you use it—after that it pays big dividends by the extra wear it makes each succeeding tire deliver.

The Coffield Tire Protector never has been — and is not now — claimed as a "cure-all" for tire troubles. It is not intended for use in either damaged or worn-out tires but is for installation in new tires or tires that at least are sound —both cord and fabric.

Besides reducing blowouts almost to the vanishing point the Coffield prevents the majority of punctures. A short nail cannot reach the tube thru the thickness of the Protector and the tough rubber from which the Protector is made will turn and clinch ninety percent of the long nails the tire may pick up.

The Coffield Protector is not a new device or an experiment. For three years it has been proving its worth to car owners—thousands of the Protectors have been sold and are in use today. There are innumerable instances of the sale of just one Protector as a trial to a skeptical customer, where that customer came back to have all of his tires equipped, including the spare.

We have a most unusually interesting proposition for the right kind of Dealers

The Coffield Tire Protector Co.
Dayton, Ohio

The nail goes thru the outer casing.

But the live rubber of the Coffield Protector (having no fabric) merely gives when the nail strikes it—and the nail clinches between the Protector and the casing.



Stones and other obstacles will not bruise a casing equipped with the Coffield Tire Protector — as the blow is distributed and absorbed by the entire casing rather than any one spot.

TWITCHELL



THE

TWITCHELL AIR GAUGE

Embodies the basic idea upon which all pencil type tire-pressure gauges are built.

The Twitchell was first with the idea and remains first in the effectiveness of its application.

The United States District Court has enjoined two new infringers of the Twitchell patent: the Protex gauge and the Rex gauge.

Patents that cover devices of questionable value and moderate success are seldom infringed, but the Twitchell gauge patent is constantly being infringed. The conclusion is easy.

The demand for Twitchell gauges is constantly increasing. If you put off sending your orders until the last minute we may have to disappoint you in the matter of deliveries. Look over your stock to-day and insure yourself against this contingency.



The Twitchell Gauge Co.

1516 South Wabash Ave. CHICAGO

Manley
Garage Equipment
MADE IN YORK, PA.

A WELL EQUIPPED SHOP
Will Lead You to Prosperity

You Service Station Men can't get the new repair business, or hold the patrons you have, unless you equip your shops with modern car repair equipment.

Take, for instance, the Manley line of presses. You have got to have a press nowadays. Car owners won't stand for sledge hammer methods any more.

For years, they have had poor labor jobs, based on the "I-Get-paid-for-my-time-anyhow" idea. But now they will pay only for skillful, efficient work.

They know now that all motor car work is pressure fitted. So they insist on pressure work instead of the sledge hammer. If you haven't a press, you can't begin to do efficient work.

Manley 22-ton presses, screw type, made in three sizes besides the bench press, fit the needs of any service station. They are designed, as are all the Manley products especially for *automobile repair work.*

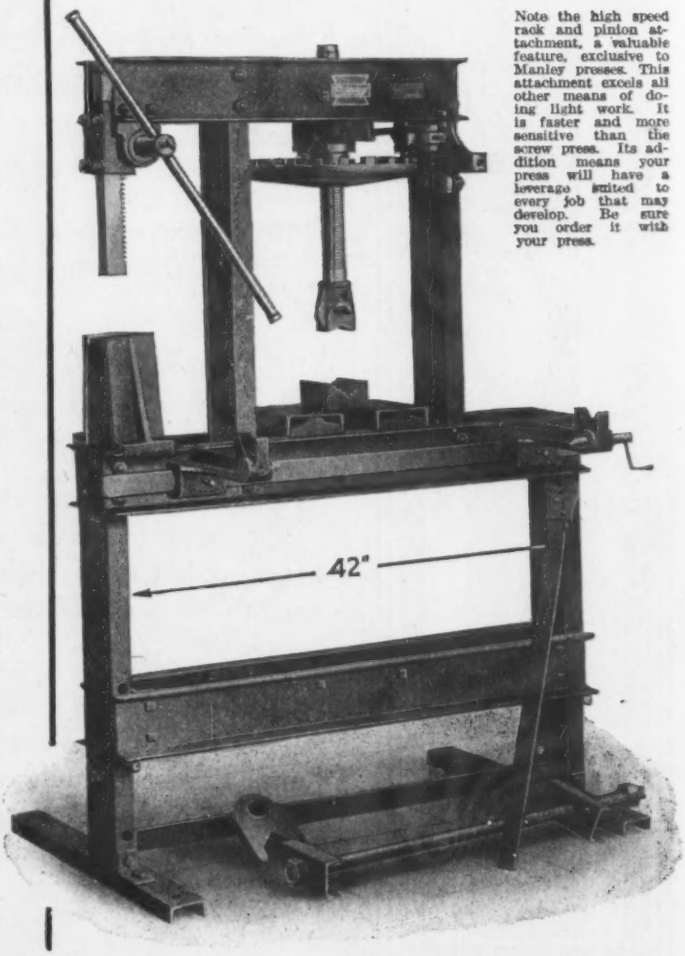
You are not getting any makeshift equipment that is a hangover from machine shop days. Routine and machine shop repair methods and equipment won't do in automotive service.

You owe it to yourself and the best interests of your own business to investigate Manlev Garage Equipment. Send for the book of Manley Helps today. You will learn how to put economy and efficiency into your business.

Write us, right now.

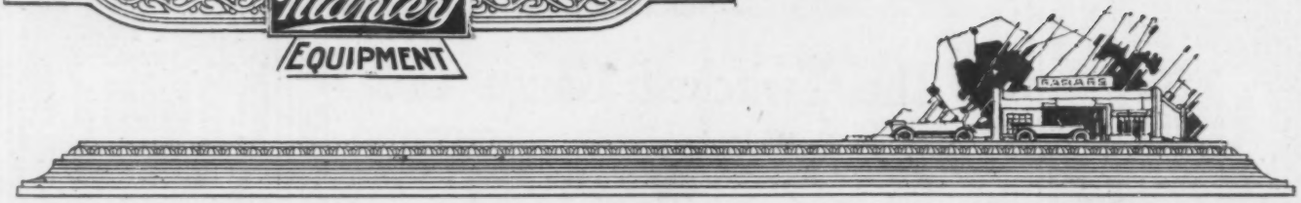
THE MANLEY MANUFACTURING COMPANY
YORK, PA.





Note the high speed rack and pinion attachment, a valuable feature, exclusive to Manley presses. This attachment excels all other means of doing light work. It is faster and more sensitive than the screw press. Its addition means your press will have a leverage suited to every job that may develop. Be sure you order it with your press.

GARAGE & SHOP
Manley
EQUIPMENT



Engine Stands, Cranes, Presses, Portable Benches, Wrecking Cranes, Bench Motor Supports, Oil Services

"WHERE CAN I BUY THE PACKING THAT MAKES GASKETS LIKE THIS?"

Your head mechanic will tell you from first hand experience why these gaskets are economical for use in your shop. The best sheet packing is inexpensive from the standpoint of what it is intended to accomplish. You pay for the use of any other kind in the extra labor of refitting a leaky joint or in a loss of patronage. A customer who comes back is far better than a customer with a "come back."

VELLUMOID
not a heat packing.

Oil-proof
Gasoline-proof
Grease-proof
Water-proof

Sold by the square yard; 36 inches wide. Thicknesses: 1-16",1-32"* .021", 1-64", .010".
*The thickness commonly used.

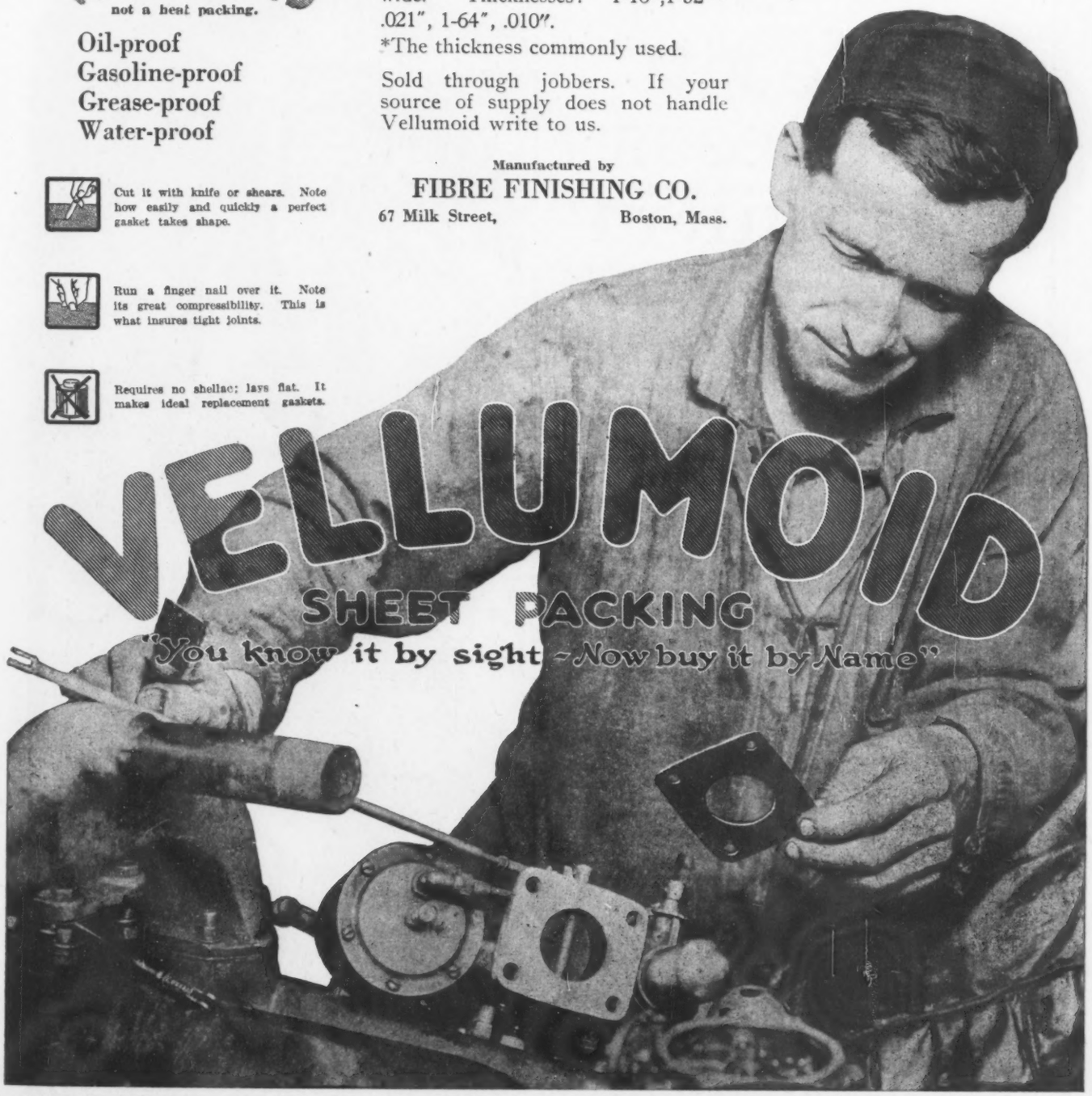
Sold through jobbers. If your source of supply does not handle Vellumoid write to us.

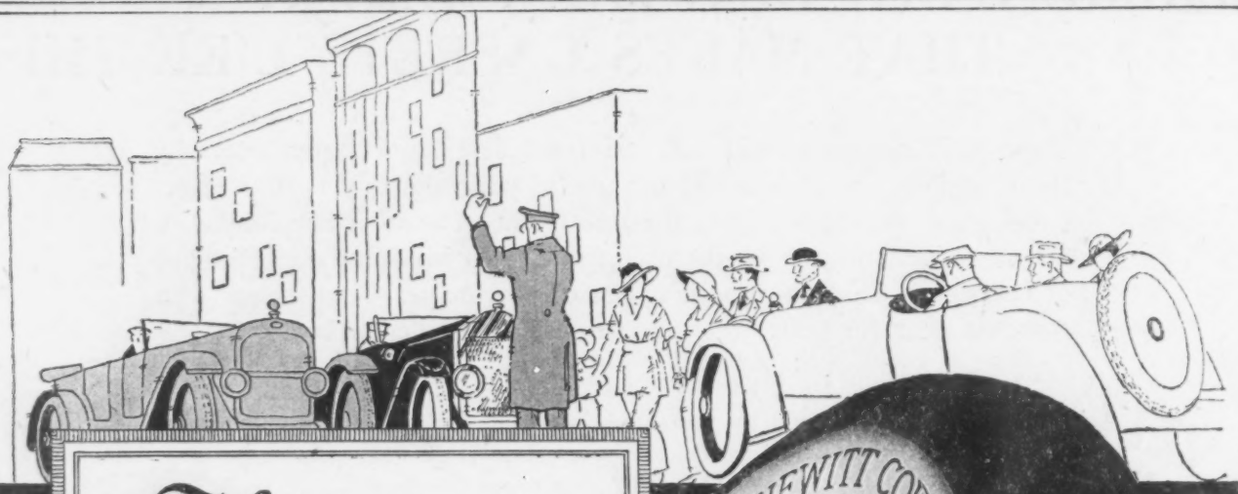
Manufactured by
FIBRE FINISHING CO.
67 Milk Street, Boston, Mass.

Cut it with knife or shears. Note how easily and quickly a perfect gasket takes shape.

Run a finger nail over it. Note its great compressibility. This is what insures tight joints.

Requires no shellac; lays flat. It makes ideal replacement gaskets.





Hewitt success is built in

HEWITT dealers know the difference between service that costs *them* money—and service that is ***built in.***

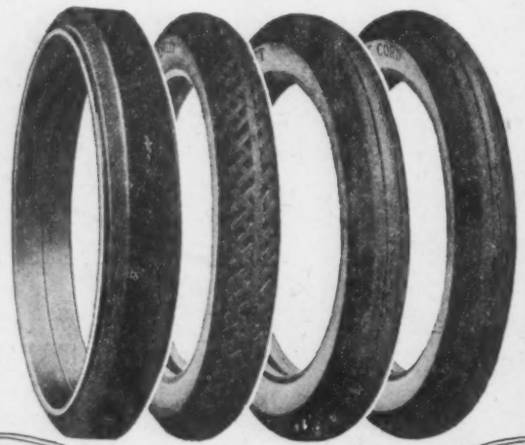
The Hewitt policy requires that:—"Every Hewitt Tire must be worthy of the Hewitt name."

This policy is the basis of Hewitt dealers' success.

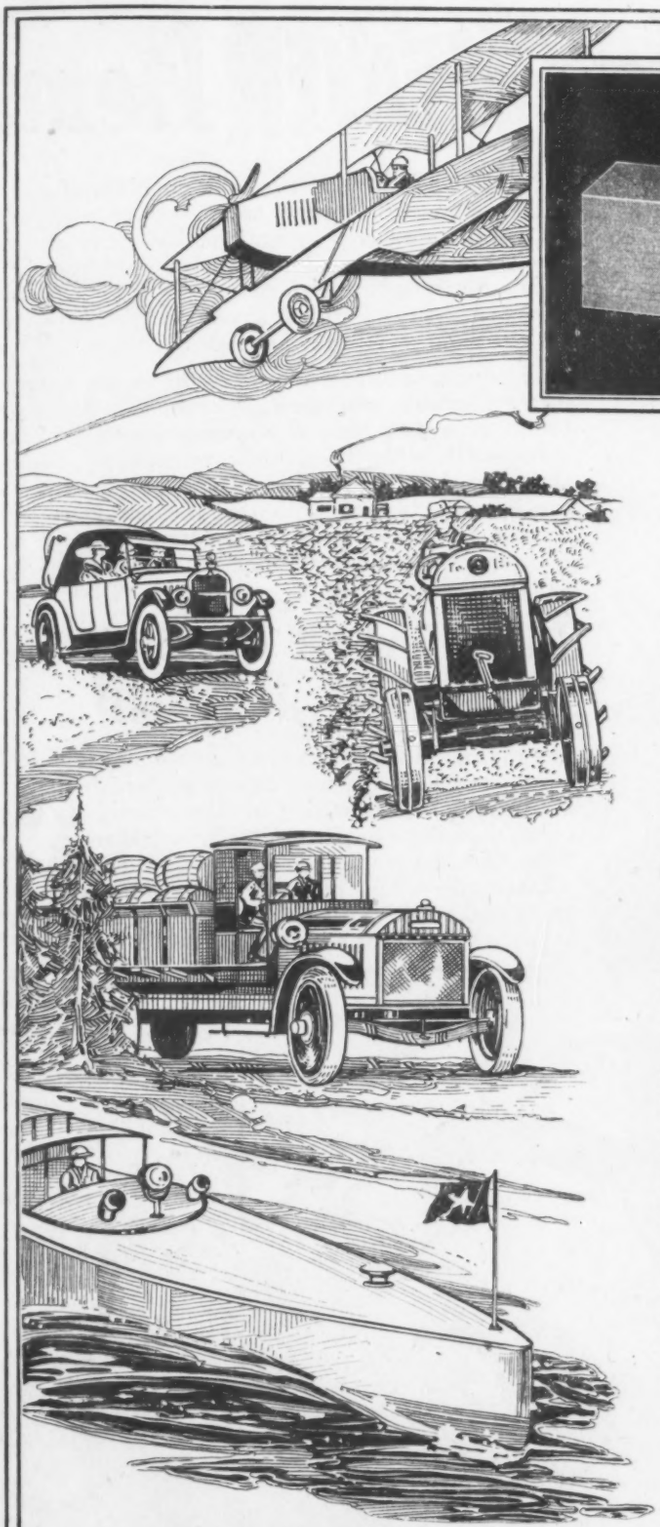
HEWITT RUBBER COMPANY

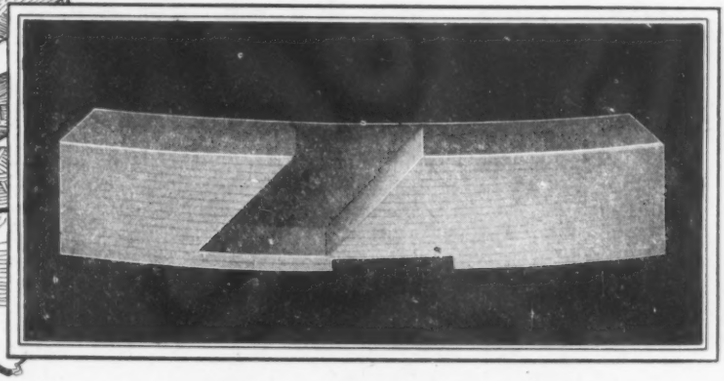
Factory and Executive Offices at Buffalo, N. Y.

New York *Boston* *Philadelphia*
Chicago *Denver* *San Francisco*









Isn't it About Time to Get the Real Truth About Piston Rings

THE demand for better piston rings is spreading faster and faster.

We see it every day in the steadily increasing sales of Permaseal Patent One-Piece Piston Rings.

The patent interlocking dovetailed joint makes Permaseal Patent One-Piece Piston Rings the one-piece rings that absolutely stop oil and gas leaks. As a matter of fact they are *even light-proof* with the gap open ⅛ inch.

All Permaseal Patent One-piece Piston Rings are individually cast. Made of tough, close-grained grey metal that is remarkably resilient—they always maintain an even pressure all around against the cylinder wall. Finished with turned surfaces they seat quickly and need no lapping in.

The Sealing Joint is made of a special heat-proof alloy that wears in the same ratio as the ring itself—no slower and no faster.

There are no ends to chip off and score cylinder walls or permit leakage. No loose inserts to slip out, no inserted rivets or pins. Permaseal Patent One-Piece Rings are genuine one-piece rings in fact.

Alert, far-seeing jobbers, dealers and repair men all over America realize that Permaseal Patent One-Piece Piston Rings are the most practical piston rings in the market—and destined to be the fastest-selling rings on the market.

Send for a trial set and try them in any kind of a motor and prove their value yourself. Money back if not satisfied.

GRUNDY MANUFACTURING CORPORATION
DETROIT MICHIGAN



PERMASEAL PATENT ONE-PIECE PISTON RINGS are furnished with Oil Groove, for exceptionally bad oil-pumping motors, at no extra cost. Specify whether you want "Regular" or "Oil Groove" type when ordering.

PERMASEAL
TRADE MARK REGISTERED U.S. PAT. OFF.
PATENTED MAY 28TH 1918. NO. 1,267,703
PISTON RINGS



THE "TIMESAVER" PISTON RING FITTER Automatically prevents filing at wrong angle. Saves time and effort, eliminates breakage, and lasts forever.

Pays for itself in the fitting of one set of piston rings. Price, complete, $2.00 each.

Two New WEAVER Items

THE MEN WHO know the problem of automobiles and garage service have appreciated what Weaver inventions have meant during the last eight years. The hours of time, the amount of human energy, and the many dollars in cash which Weaver accessories have saved tell their own story of Weaver's service to the trade.

And now, to add the next chapter to the interesting history, come two new Weaver products—each based on a new idea of convenience to automobile men—each with the definite purpose of making a mean job easy. And, like all the other members of the Weaver family, both the **Weaver Wire Wheel Repair Stand** and the **Weaver Universal Axle Stand** earn dollars for garage men by turning out better work in minimum time.

The WEAVER WIRE WHEEL REPAIR STAND

fills that need which garage men have always felt for a substantial, single-unit device on which the aligning, trueing and repairing of wire wheels can be performed in the easiest, most efficient manner. It is a most complete device—durable and substantial—with a convenient rack for spare parts and tools. An adjustable gauge affords a perfect guide for aligning each wheel while the repair work is being done.

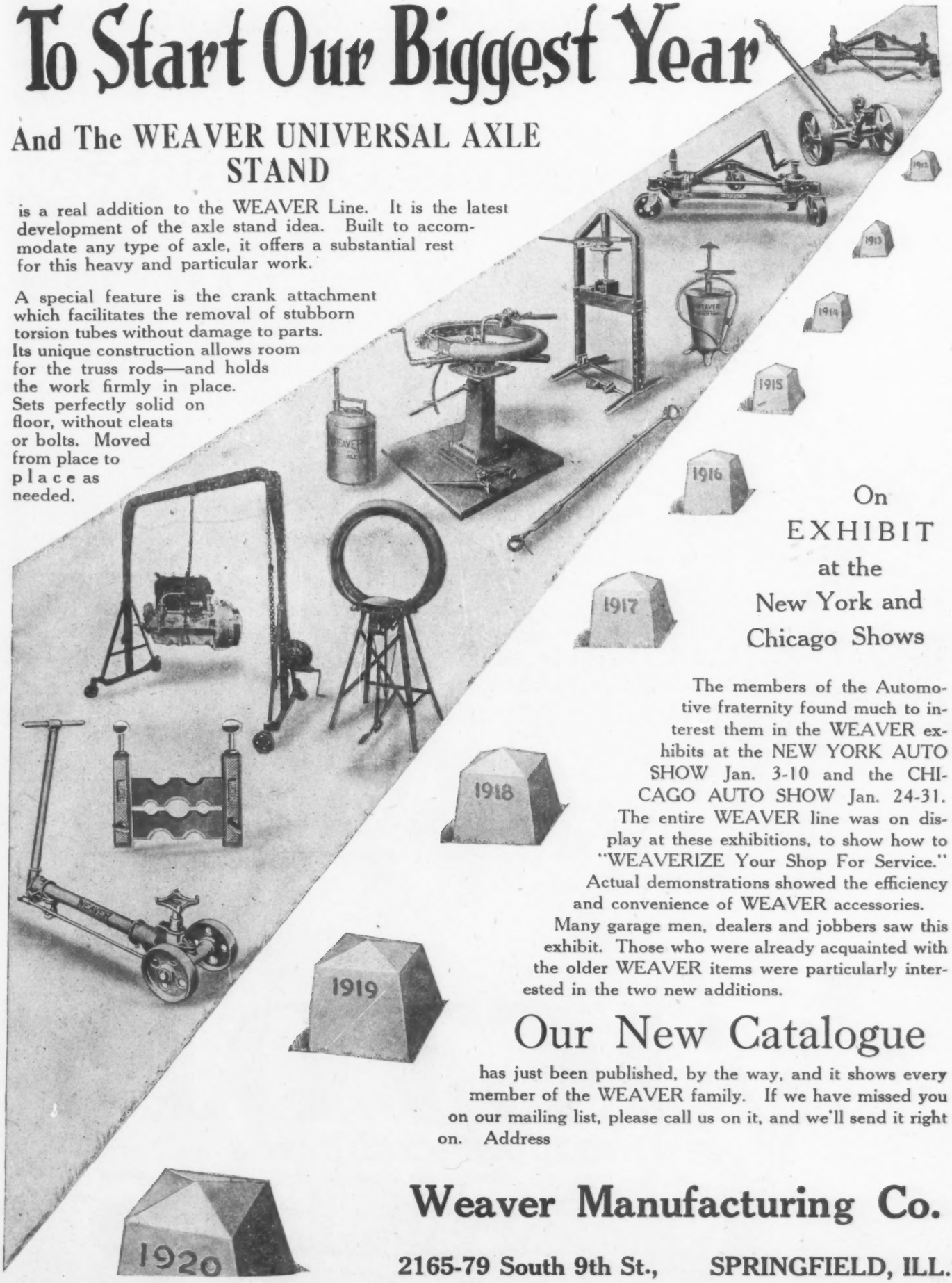


To Start Our Biggest Year

And The WEAVER UNIVERSAL AXLE STAND

is a real addition to the WEAVER Line. It is the latest development of the axle stand idea. Built to accommodate any type of axle, it offers a substantial rest for this heavy and particular work.

A special feature is the crank attachment which facilitates the removal of stubborn torsion tubes without damage to parts. Its unique construction allows room for the truss rods—and holds the work firmly in place. Sets perfectly solid on floor, without cleats or bolts. Moved from place to place as needed.



On EXHIBIT at the New York and Chicago Shows

The members of the Automotive fraternity found much to interest them in the WEAVER exhibits at the NEW YORK AUTO SHOW Jan. 3-10 and the CHICAGO AUTO SHOW Jan. 24-31. The entire WEAVER line was on display at these exhibitions, to show how to "WEAVERIZE Your Shop For Service." Actual demonstrations showed the efficiency and convenience of WEAVER accessories. Many garage men, dealers and jobbers saw this exhibit. Those who were already acquainted with the older WEAVER items were particularly interested in the two new additions.

Our New Catalogue

has just been published, by the way, and it shows every member of the WEAVER family. If we have missed you on our mailing list, please call us on it, and we'll send it right on. Address

Weaver Manufacturing Co.

2165-79 South 9th St., SPRINGFIELD, ILL.

Victor Gaskets Dominate

OUR recognized leadership in the automotive industry today is due to our policy of holding steadfastly to the original ideal of specializing entirely upon copper and asbestos gaskets for internal combustion engines.

To meet the constantly increasing demand for Victor Gaskets we have just completed the largest and best equipped gasket plant in the world.

This new home is not alone a measure of wonderful progress since we made the first copper asbestos gasket eleven years ago. It is our assurance to the trade of an even better product and a continuation of the high type of service which is responsible for Victor domination today.

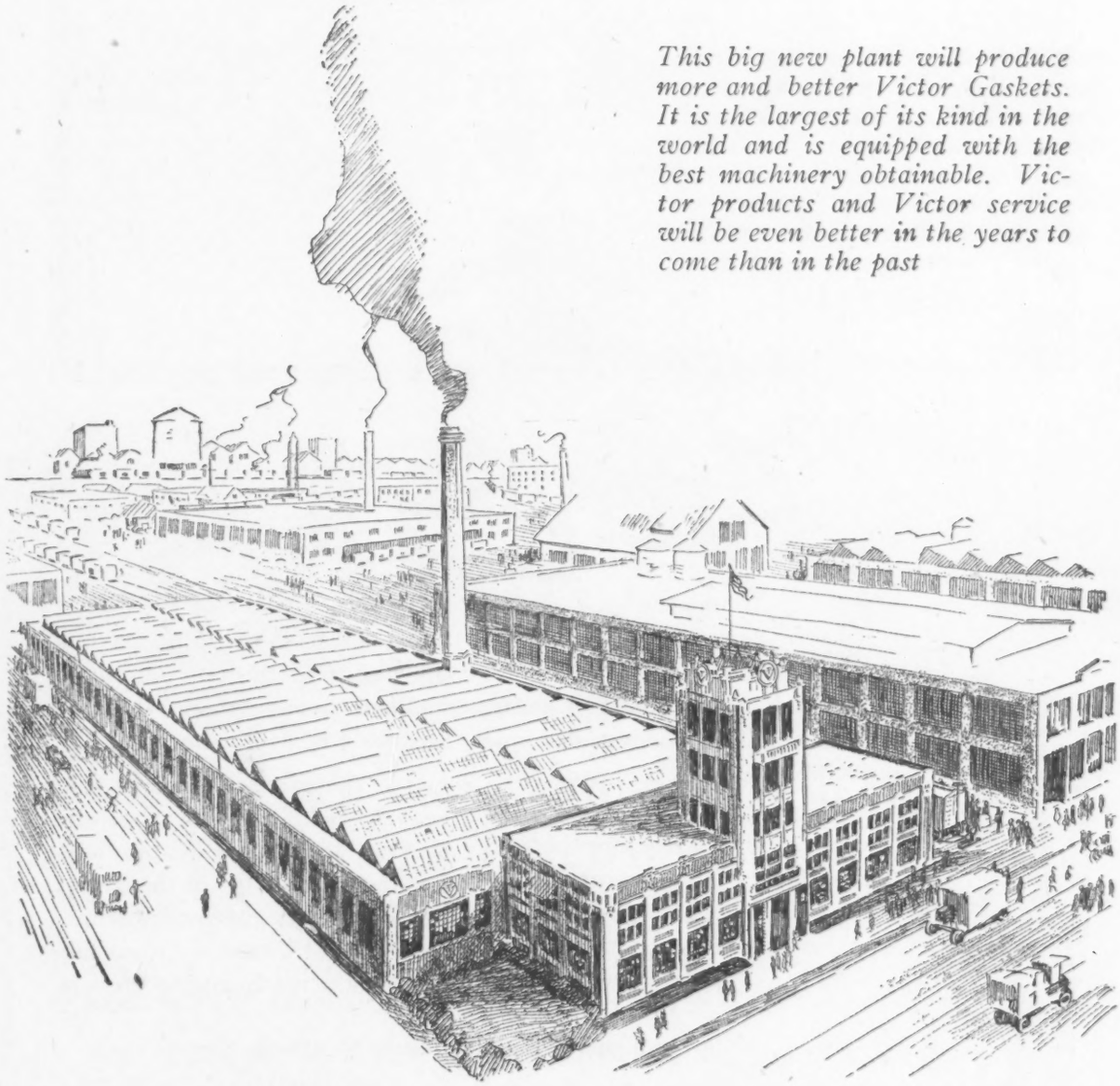
VICTOR MANUFACTURING & GASKET COMPANY

The World's Largest Gasket Manufacturers

5750 Roosevelt Road Chicago, Illinois

The World's Standard Gaskets

VICTOR copper-asbestos GASKETS



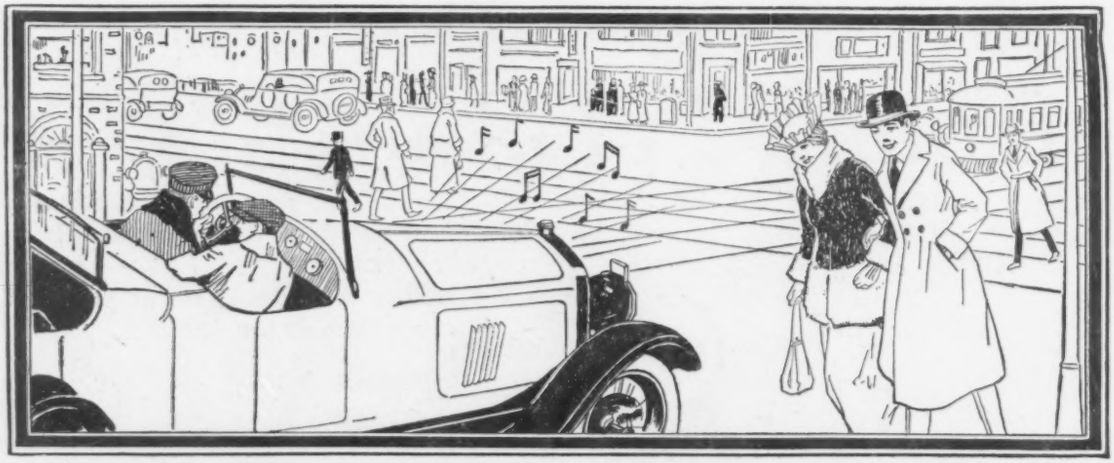
This big new plant will produce more and better Victor Gaskets. It is the largest of its kind in the world and is equipped with the best machinery obtainable. Victor products and Victor service will be even better in the years to come than in the past

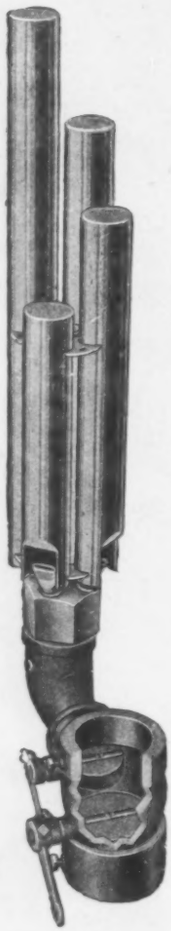
VICTOR

copper-asbestos

GASKETS

The World's Standard Gaskets





The AERMORE Exhaust Horn

"THE SIGNAL WITH A SMILE"

On congested city streets, or in the country, the musical notes of this kindly signal are appreciated by both pedestrians and the driver of the car ahead.

There is no angry Burr-r-r nor nerve racking screech to the Aermore Horn. Its pleasing harmonious call has a chime-like chord unknown to other signals.

Its sound is readily heard above the din of traffic, in fact the noises of the city submit to its clear strong voice. It is the aristocrat of Motor horns.

The Aermore is made of four heavily nickeled brass pipes and attached to the exhaust pipe utilizes the exhaust gas of the engine —the result is a refined warning that says "Please" to other motorists and the hurrying crowds.

Shipped complete, ready to attach.

11" Aermore Horn for Ford Cars **$7.00**	**13" Aermore Horn for cars of 25 H. P.** **$8.00**
15" Aermore Horn for cars of 30 H. P. **9.00**	

Order from your dealer or jobber. If ordering direct give dealer or jobber's name, the name of car and outside diameter of exhaust pipe.

THE FULTON CO.

1910 St. Paul Ave. Milwaukee, Wis.



Cletrac
TANK-TYPE TRACTOR

Hard going here, but - *Easy on a TRACK, the Cletrac way*

Let's Get Acquainted at the Big Tractor Shows

Don't miss the Cletrac at the big Tractor Shows.

We'll be glad to meet you. You can inspect the Cletrac, get all of the facts first-hand about this powerful, compact, sure-footed Tractor—

And learn how Cletrac dealers enjoy a big all-year market of steady, profitful sales.

Be sure to visit the Cletrac exhibit at the big shows:

Minneapolis, Minn. - January 31st to February 7th
Wichita, Kansas - - - February 9th to 14th
Kansas City, Missouri - - February 16th to 21st

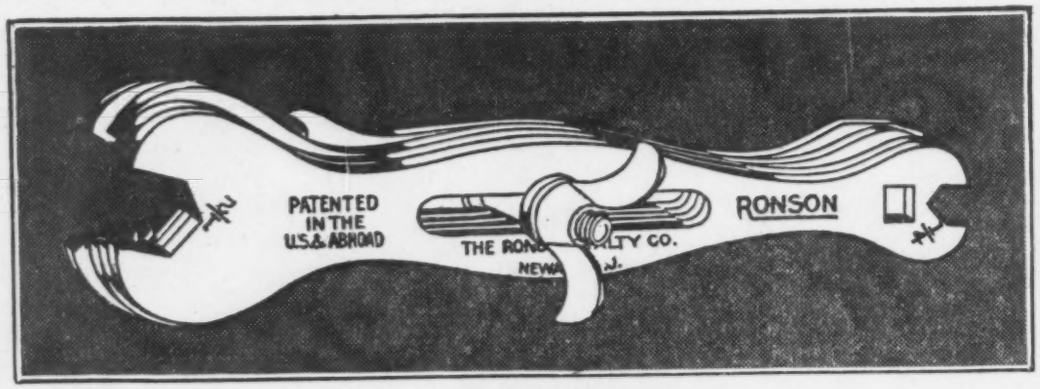
Let's get acquainted! We have a Tractor and a proposition that will interest you.

You should have the booklet
"Sales Quality in Tractors"
Write for it.

The Cleveland Tractor Co.

Largest Producers of Tank-Type Tractors in the World

19169 Euclid Avenue Cleveland, Ohio



The Tool Kit That Fits the Pocket!

Here is the famous RONSON Wrench—a whole tool kit in itself—as useful as it is unique.

Think of carrying eleven handy tools in your pocket! No more fumbling around in the cold or dark for the right tool—a RONSON Wrench supplies the tool needed—quick! Weighs only eight ounces, yet is sturdy and strong. Made of drawn tempered steel. Retails for only $1.

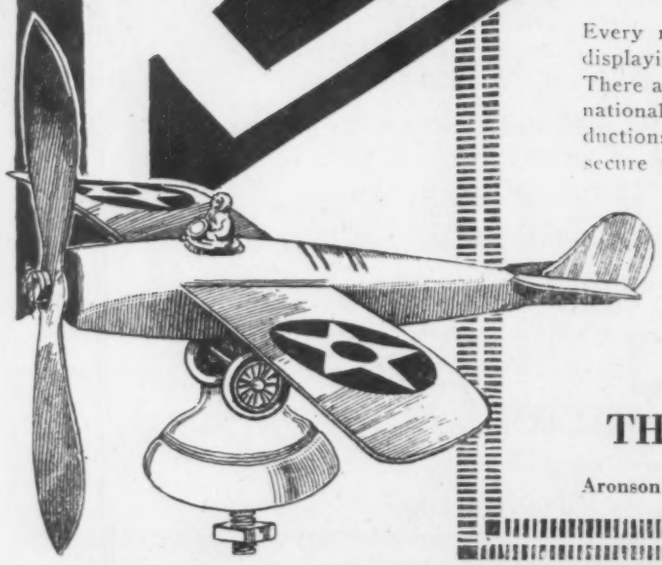
More than a million RONSON Wrenches have been sold and the demand is growing every day. See your jobber at once, or send for details of our unusually attractive proposition.

RONSON



The Fad That Has Come to Stay

Every motorist can now express his own individuality by displaying one of the new RONSON Radiator Ornaments. There are fraternal emblems for "Brothers in good standing," national emblems for the patriotic, wonderful life-like reproductions of animals for nature lovers, physicians crosses that secure the right of way in emergencies, monograms, aeroplanes and many humorous designs. RONSON Ornaments are masterpieces of modeling, unique in their originality and artistically plated in many finishes.



Send for catalog of designs and our liberal-profit proposition.

THE ART METAL WORKS

Aronson Square Newark, N. J.









Take Your Choice of These Big Paying Jobs

THOUSANDS of men like you are wanted to fill these big-paying jobs in the automobile engineering field. Thousands of places are open, too, for chauffeurs and garage managers. It's easy to get one of these good jobs and to prepare yourself to hold it. You don't have to go to school. You don't have to serve an apprenticeship. Spare time only is needed. These great automobile books will teach you everything you need to know. Fifteen of the greatest engineers and experts in the business wrote them in simple language that anybody can understand.



Auto Books

6 Volumes Shipped Free

Just off the press—the 1920 model—an up-to-the-minute six-volume library on Automobile Engineering, covering the construction, care and repair of pleasure cars, motor trucks and motorcycles. Packed full of advance information on Lighting Systems, Garage Design and Equipment, Welding and other repair methods. Contains everything that a mechanic or an engineer or a motorcyclist or the owner or prospective owner of a motor car ought to know. Anybody can understand them. Tastefully bound in American Morocco, flexible covers, gold stamped, 2650 pages and 2300 illustrations, tables, blueprints and explanatory diagrams. A library that cost thousands of dollars to compile but that comes to you free for 7 days' examination. Over 50,000 sets of previous editions have been sold.

Partial Contents

Automobile Motors; Welding; Motor Construction and Repair; Carburetors and Settings; Valves, Cooling; Lubrication; Fly-Wheels; Clutch; Transmission; Final Drive; Steering Frames; Tires; Vulcanizing; Ignition; Starting and Lighting Systems; Shop Kinks; Commercial Garage; Design and Equipment; Electrics; Storage Batteries; Care and Repair of Motorcycles; Commercial Trucks; Gas Tractors.

128 Blueprints of Electric Wiring Diagrams

Only 7c a Day!

Not a cent to pay in advance. First you see the books in your own home or shop. Just mail coupon and pay express charges when books arrive. You can read them and study them for seven whole days before you decide whether you want to keep them or not. If you like the books, send only $2.80 in seven days and $2 a month until the special introductory price of $21.80 has been paid. (Regular price $30.) Along with the set goes a year's consulting membership in the American Technical Society. (Regular price $12.) This part of our offer will be withdrawn when the membership is filled. Mail the coupon without delay.

Don't Send Money Now!

Don't take our word for it. See the books without cost. Here is a chance for you to get a real man's job with a man's size pay. Don't waste a minute in sending the coupon. Put the coupon in the mails today. Send no money—just the coupon!

American Technical Society, Dept. A411C, Chicago, Ill.

FREE Examination Coupon

American Technical Society, Dept. A411C, Chicago

Please send me the 6-volume set of Automobile Engineering for 7 days' examination, shipping charges collect. If I decide to buy, I will send $2.80 within 7 days and the balance at $2 a month until the $21.80 has been paid. Then you send me a receipt showing that the $30 set of books and the $12 Consulting Membership are mine and fully paid for. If I think I can get along without the books after 7 days' trial, I will notify you to send for them at your expense. [Please fill out all lines.]

Name .....

Address .....

City ..... State .....

Reference .....

In place of expensive stocks you have this swatch booklet showing the 28 colors and fabrics of Campbell Detachable Upholstery. You have no money tied up and there is no danger of leftovers that will be out of style next season.



Instead of stocks, this swatch booklet

The accessory dealer who handles Campbell Detachable Upholstery carries no expensive stocks of seat covers. Instead, he is supplied with a swatch booklet from which to make his sales.

This is, however, not the only feature that makes Campbell Detachable Upholstery easy to handle. There is, in addition, the superior quality of the 28 cloths and fabrics, the perfection of the fit, and the many other prominent selling points. Prompt delivery also insures satisfied customers.

This Seat Cover De Luxe fits over the cushions, backs, arms, and doors snugly and smoothly. This is so because the skilled Campbell Upholsterers spend days in measuring every new car for master patterns—each curve and corner must and does fit perfectly.

With these covers there is also the sales assistance that comes with offering an article that makes a distinctive car out of an ordinary automobile. Campbell Detachable Upholstery imparts a touch of the same individuality that women find in the latest creation of the fashion makers of Paris.

More than 15,000 dealers handled Campbell Detachable Upholstery last year. Sold from a swatch booklet as it is, there is little overhead —your margin is net profit, every cent of it.

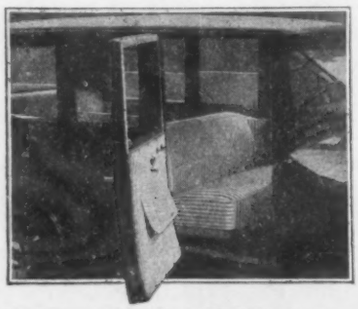
The particulars about this accessory, with its universal market are interesting. Let us send them to you. Write

THE PERKINS-CAMPBELL COMPANY
625 BROADWAY **CINCINNATI**

Campbell
ESTABLISHED 1879

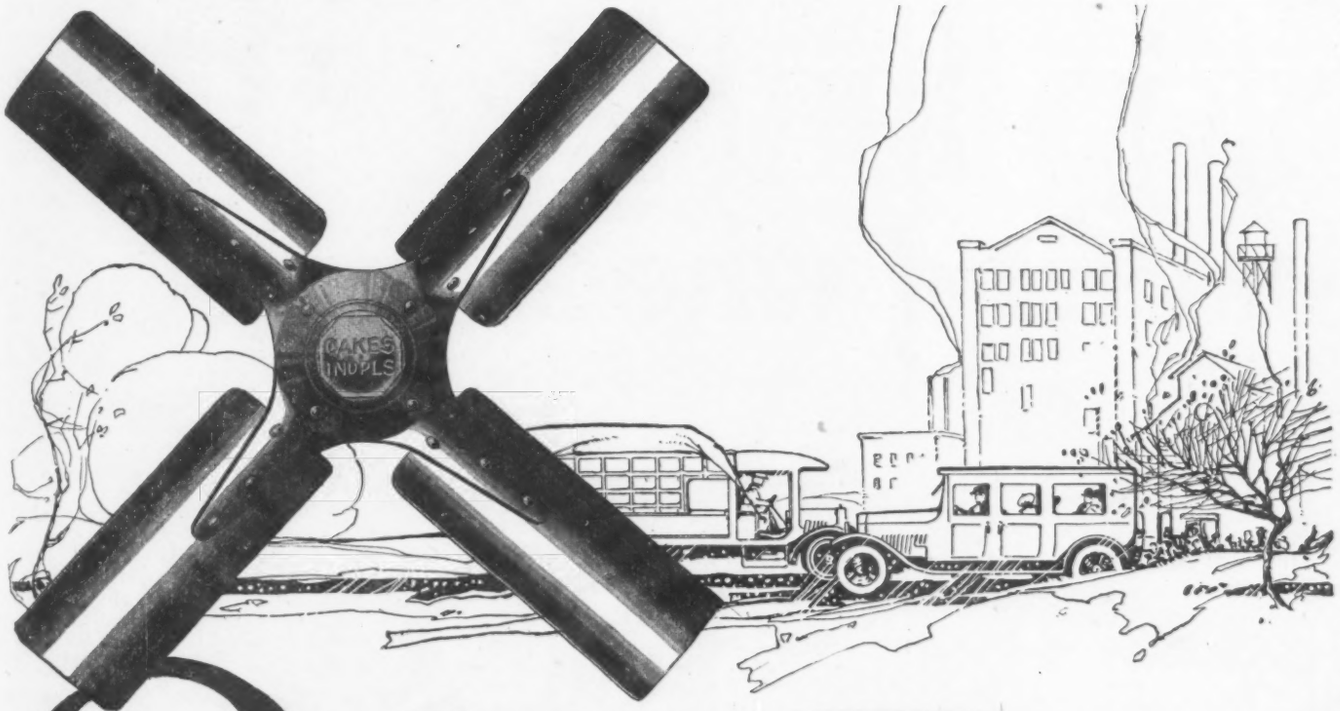
DETACHABLE UPHOLSTERY

Motorists have learned the advantages of full dress in motor cars—and they have learned likewise, that of all the effects, the most charming are those achieved with Campbell Detachable Upholstery. This Seat Cover De Luxe lends color, piquancy, and cleanliness to the closed car—the limousine, sedan, coupe.



Each set of Campbell Detachable Upholstery is sent wrapped in a smart craft package, together with a small bag of hardware, and instructions for applying. It is a profitable accessory to take on.

THE PERKINS-CAMPBELL COMPANY ***625 Broadway*** **CINCINNATI, OHIO**



Efficient Cooling Oakes Fans

Our ability to produce fans which in every way measure up to the high standards of America's best builders of trucks, cars and tractors, proves that "Fan Headquarters" can successfully solve your cooling problems.

At the Chicago Show Booths 141 *to* 145

OAKES

The OAKES COMPANY

Indianapolis, U.S.A.

Stop that Rattling steering wheel



TRADE APCO MARK

STEERING COLUMN BRACE

¶ Sold through jobbers only in 126 cities in the United States and Canada

Our New Catalog is Waiting for You

The Steering Column on the Ford car has no support except at the dash where it is held by four bolts and as the wheel is often used as a handle for the driver to get in and out of the car these bolts loosen and continual vibration makes matters worse, sometimes causing the column itself to break. In going over extremely rough roads the wheel vibrates excessively, giving one the impression that the car rides harder than it really does.

The Apco Steering Column Brace

—is fastened to the upper part of the dash at one end and to the steering column at the other, preventing all vibration and making the steering column as solid as a rock. Most large cars have a device of this kind and the Ford is a better car with one. It is made from malleable iron, black enameled, and is furnished complete with bolts and nuts.

MANUFACTURED BY

APCO MANUFACTURING COMPANY

Providence, U. S. A.

ALL-WAYS TRADE APCO MARK RIGHT

STORM
MOTOR REPAIR EQUIPMENT



Storm Standard Reboring Machines have been tested, approved and are being recommended by all leading jobbers and manufacturers throughout the world. *Made by practical men for practical purposes.*

Makes You Able to Handle Any Motor Repair Job

GIVE your customers quick service on first-class repairs. Sending out the most profitable jobs to other repair shops means loss of time and money. Storm Tools will equip you for every class of repair work. You can make the dull season a profitable period in general overhauling and rebuilding. You will soon become known as the leading repair shop in your community.

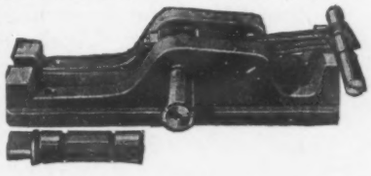
Storm Equipment is standard and is built for hand or power operation. No matter how small your garage is—or how large—we can supply you with Storm Tools that will increase your output and your profits.

Ask for our catalog and full details. It will pay you to look over our line.

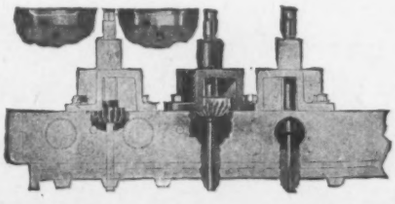
Storm Manufacturing Co.

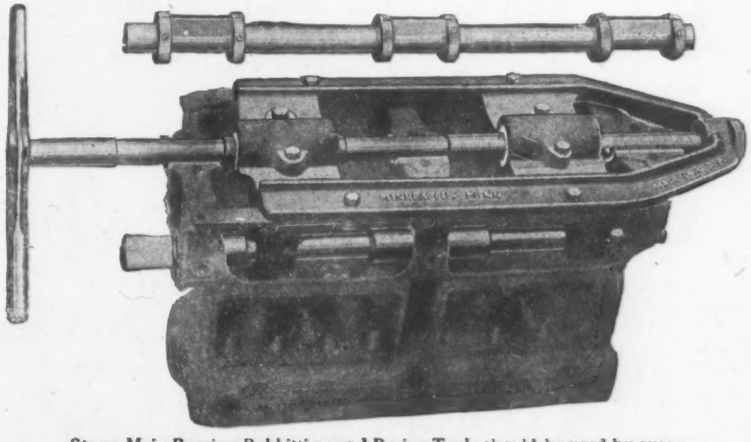
Dept. A **Minneapolis, Minn.**

The Storm Connecting Rod Bearing Reamer, Jig and Straightening Gauge accurately and quickly fits and cleans connecting rod bearings—tests and straightens the rod.



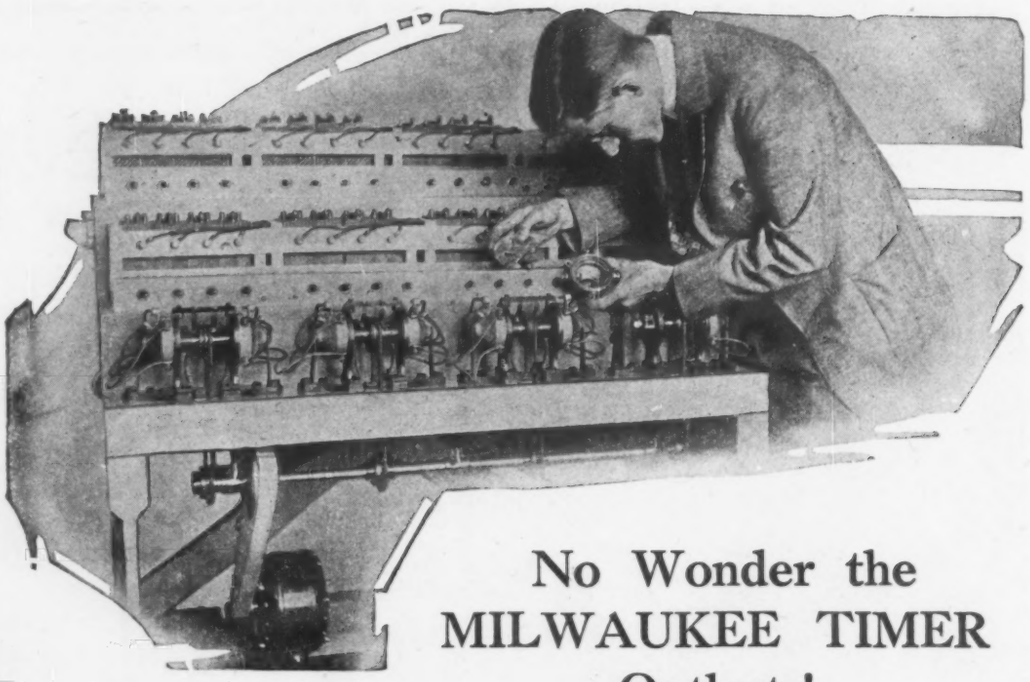
The Storm Valve Port Renewing Tool renews valve systems completely—enlarges the port, produces new narrow seat and new accurate stem guide.

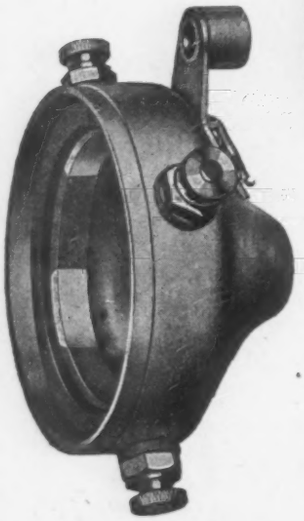




Storm Main Bearing Babbitting and Boring Tools should be used by every shop doing Ford and Fordson work. For making new, *perfect* main bearings in proper position and perfect alignment. *Speedy and accurate.*

More Than 1,000,000 Milwaukee Timers Will Be Sold This Year





Retail Price
$2.25

No Wonder the MILWAUKEE TIMER Outlasts!

There is no guesswork about the absolute precision and durability of the Milwaukee Timer for Fords.

Milwaukee Timers are service-tested by experts on a specially-designed machine. Timers are taken at random from stock and run for thousands of miles at a speed equivalent to 30 miles an hour.

Various methods of lubrication are tried out. At frequent intervals the timers are taken apart and inspected for possible weaknesses. Such care on our part is bound to produce a timer that you can rely on absolutely.



Hub Bore: Carefully bored and reamed to size. Tested on jigs to assure perfect fit.

Roller: As precisely made as a ball bearing. Machined, hardened, ground and polished. Always bears **squarely** on contacts.

ROLLER PIN:
Practically wear-proof. Carefully fitted to insure perfect roller action.

Precision Ignition at All Speeds

The Milwaukee Timer is a sure cure for nine out of ten ignition troubles. It makes the Ford pull evenly, hitting smoothly on all four cylinders. It makes starting easy — keeps plugs from fouling unnecessarily — stops the galloping, thumping and balking of the Ford engine.

Over 1,000,000 Milwaukee Timers will be sold during 1920, because almost every Ford owner recognizes this precise, durable timer as the ***standard replacement for Fords.*** They know that prevention is better than cure for ignition troubles. They want a smooth-pulling, sweet-running Ford and a Milwaukee Timer is the answer.

The Milwaukee Timer is sold and recommended by 75% of all Automotive Supply Jobbers and by most dealers. Write today for your copy of 1920 catalog.

MILWAUKEE AUTO ENGINE & SUPPLY CO.
Dept. 621 Milwaukee, Wis.

THE ZINKE CO., CHICAGO, SALES REPRESENTATIVES

MILWAUKEE TIMER *for* FORDS

85% are Prospects for this Truck

IT IS best for the dealer because it is best for the USER. The model "48," 2-ton, worm-drive Dearborn will outsell any truck in its class on *points and performance*.

Facts incontestible—basic TRUTH is the foundation for the superiority of

DEARBORN TRUCKS

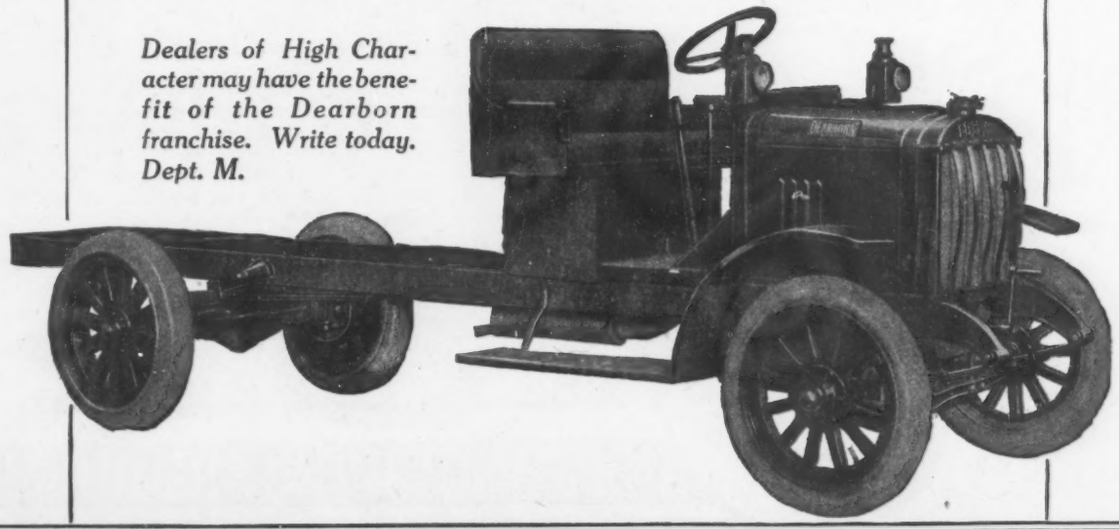
Scientifically designed, *light-weight*—super-quality steel—makes a Dearborn 500 to 2000 lbs. lighter than other worm-*drive trucks*.

The full, economical advantage of this light weight is realized by employing the World's Standard Working Units such as—Buda Motor, Bosch Magneto, Stromberg Carburetor, Stewart Vacuum Feed, Fuller Clutch and Transmission, Standard Worm-Drive Axle.

The Buda Motor's excess power is used for the load—not to pull excess truck weight. The result is The Dearborn uses less oil and gas than any truck in its class. It is *easier* on *tires*, and it has the highest *possible* average of daily performance. It gives the *World's* lowest hauling cost, and fills the need of 85% of all truck users.

The Dearborn Truck Company
2015 S. Michigan Avenue Chicago

Dealers of High Character may have the benefit of the Dearborn franchise. Write today. Dept. M.





BEAR Q.D. Non-Skid Chains

Every Motorist Should Have a Set of Bear Quick Detachable Non-Skid Chains

Because they save chains, casing, time, trouble and money. And besides this—they really do pull cars out of the mire. Even if the motorist does carry a set of ordinary skid chains in his tool box—when he gets stuck—needs them most—they do him no good—he can't get them on. Here is where Bear Q-D Chains make good. The motorist finds they are ready under any and all conditions—not only a Non-Skid Chain to be used for all purposes, but an emergency chain as well.

"Bear This in Mind"

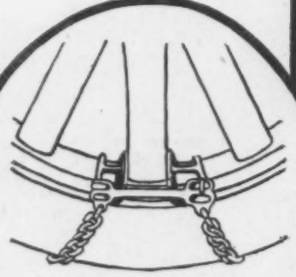
The average car owner wears out his chains—and casings, too, because he runs on his chains longer than necessary, simply because of the bother in taking them off. He will take Bear Q-D Chains off because they come off in a jiffy. That's why car owners buy Bear Quick Detachable Non-Skid Chains—and why they will net you generous profits. Write at once for details and send us name of your jobber.

Bear Manufacturing Co.
ROCK ISLAND, ILL.

It's as Easy as This

NO JACK
NO TOOLS
NEEDED

Off and on in a Jiffy



The BEAR Q-D
Non-Skid Chain Attached

Stiles

ADJUSTABLE EXPLOSION WHISTLE

The STILES is a most dependable warning signal for passenger cars and trucks. It can be adjusted for fullest volume of tone on any cylinder of any car or truck It is the *only adjustable explosion whistle manufactured.*

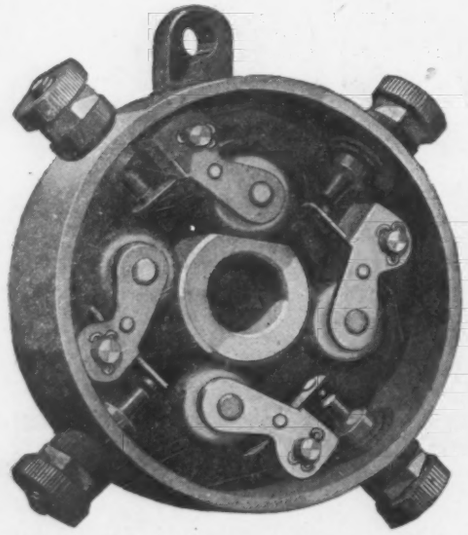
The STILES may be depended on regardless of motor's speed or compression. Installed in place of priming cup, except on Fords, where special adapter in connection with regular spark plug is used. No mechanical work necessary —requires no attention. Operates by cord attached to dash or steering column. Fully guaranteed.

Dealers and Jobbers: Motorists and truck owners will buy a warning signal that is *dependable all the time.* That's why the market for the STILES is virtually unlimited—and that's why it will pay you to get in touch with us at once. Price $4.00 complete.

STILES MFG. CO.

St. Louis Missouri





DUNTLEY

MAGNETO BREAK TIMER

Here is a timer that embodies all those eternally sought for qualities of sturdiness, dependability and efficiency. Over 50,000 miles of perfect service, that is what you will get with the new Duntley timer, which is ten times the life of the ordinary timer.

It has no sliding contacts to skip over metal segments, to wear out, or become insulated with oil. It is self-cleaning and requires no lubrication. These are just a few reasons why the Duntley Magneto Break Timer is the Best.

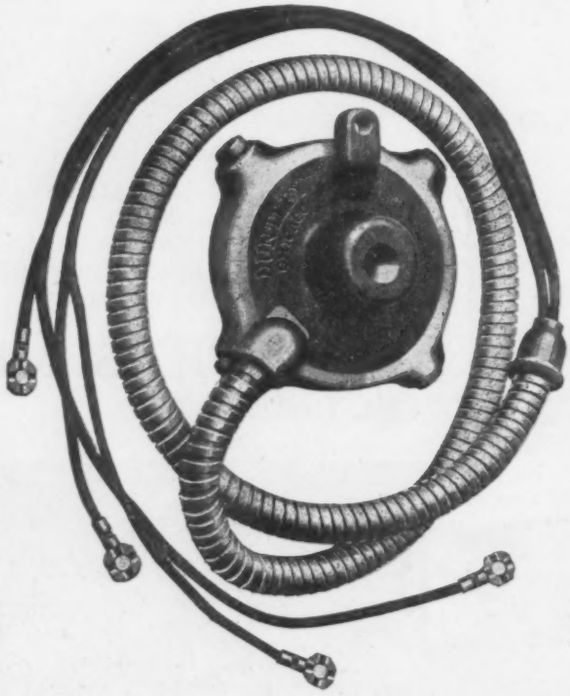
Duntley Metal Clad Cable and Wire Guard

Eliminates broken wires, loosened connections and short circuits.

Timer terminals and connections are protected by metal armor.

Wires to the coil box run thru a flexible metal conduit.

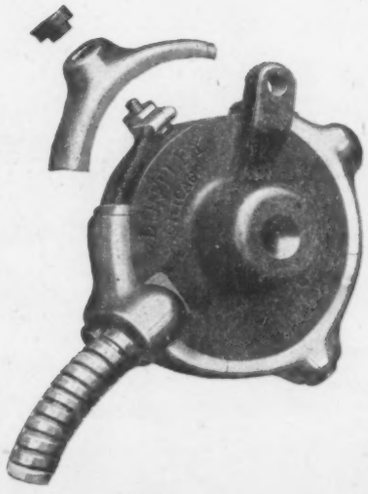
Quickly and easily installed and instantly removable in sections for access to timer terminals.



Car owners, dealers and jobbers, write for descriptive circular.

Sold to the trade thru regular channels.

Fits Duntley Magneto Break or Standard pattern Ford or Fordson Timers.

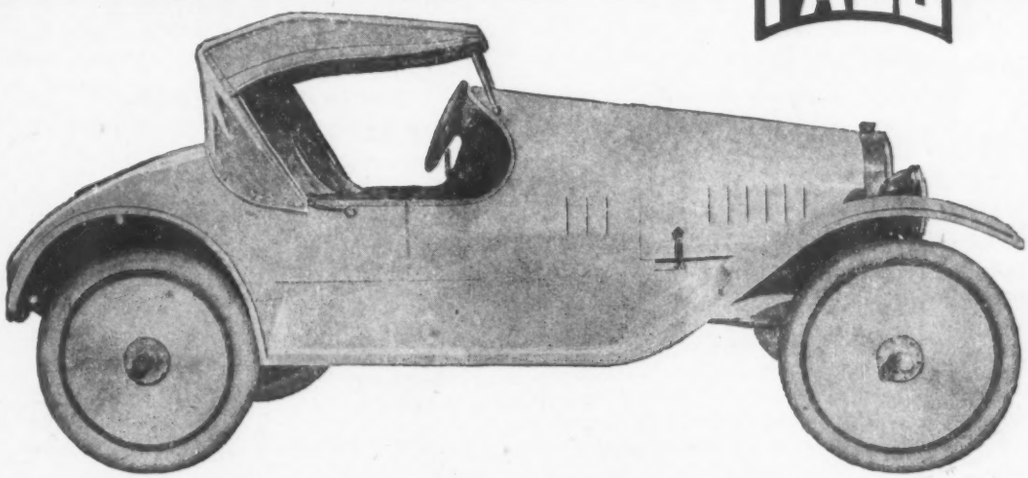


Everlastingly Guaranteed to Make Good

J. W. DUNTLEY

1004 S. Michigan Ave. Chicago, Ill.

Get Ready for Real Driving This Spring With a PACO



Drive a car with real snap and class to it! Equip your Ford chassis with a PACO BODY and transform it into a distinctive, smart little roadster. And, say, talk about speed! You'll be so surprised at the get-away, and the thrill of giving the other cars your dust, that you will wonder how you ever enjoyed driving in an ordinary car. Get your car ready for spring and summer driving now. Order YOUR PACO BODY!

PACO—The Original Racing Body

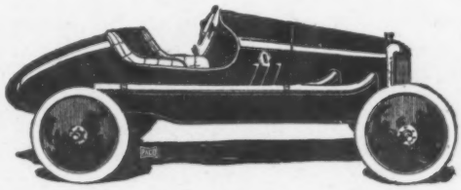
There may be numerous imitation speed bodies, but there is ONLY ONE GENUINE PACO—we make it. We are the patentees, sole owners and sole manufacturers of the Paco Racing Body. Paco designs are protected by U. S. Patents Nos. 50,218 and 50,448.

PACO BODIES are modeled after world famous speed champion cars. There is a distinctive foreign look, imparted by French racing lines. PACO BODIES are well built of automobile steel panels on sturdy hardwood frame construction. Every model is completely equipped, ready to attach.

New Paco Models Now Ready

The 1920 Paco Models are now ready for shipment. Illustration above shows Paco Model 21, the most complete racing body of its type made. Equipped with Paco Sport Top and Windshield.

WRITE TODAY for illustrations, prices and all information about the different PACO MODELS for 1920. Get the details about PACO—The Original Racing Body.



PACO Racing Exhaust

The Special Paco Racing Exhaust Pipe is shown attached to a Paco Body. This gas tight exhaust pipe adds to the speed of your car and makes it a real racer.

PACO MANUFACTURING CO.

Dept. 201, Peoria, Ill.

"GOOD SELLERS AND PLEASE ALL USERS"

THE MARQUETTE LINE

Marquette Tire Tool **Marquette Luggage Carrier**
Little Giant Split Rim Tool

User Demand
Increasing daily.

Manufacturer's Advertising
Liberal for national and local field.

Factory Production
Ample for prompt deliveries.

Dealer Profit
Good on all three big sellers.

USERS ARE SATISFIED BUYERS

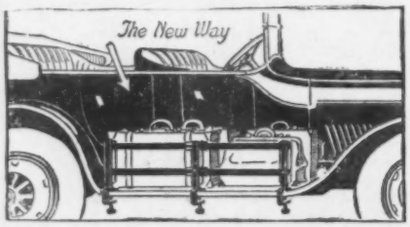
Sold by Dealers and Jobbers throughout the United States and Canada. If your jobber is not yet supplied, you can order from the factory direct. Send your jobber's name with your order.

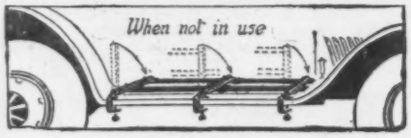
Marquette Tire Tool

Grips and holds the tire without bruising or tearing. Gives leverage on a clincher tire, so it's off quickly or on again in a minute or less.

Overcomes the hardest, dirtiest, most exasperating and useless grief of a clincher tire repair job. Simple, well made and not expensive. In the emergencies of tire troubles is a necessary car equipment, pleasing thousands of users.







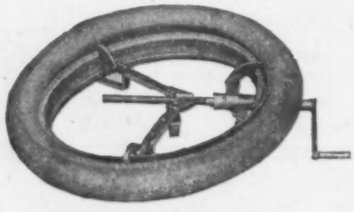
Marquette Luggage Carrier

All steel—light, attractive, rugged design—well built for long service. Fit any car—made in two sizes, four-foot and five-foot running boards.

Fold down compact when not in use. A comfort to car passengers and saver of luggage and car damage. Made to give dependable, long time good service and look well. The cost is moderate.

Little Giant Split Rim Tool

Gives the service of an $80 outfit at less than one-quarter that cost. Important, reliable equipment for every service car and tire repair department.



No more pounding, bruising and cussing a tight split rim on a repair job. No more waste of valuable minutes or hours on the job when there is a "tough" rim to handle. The Little Giant Tire Tool is certain and quick acting—absolutely efficient, powerful and durable. Grips the rim securely, contracts or expands it easily, quickly, perfectly, just where and when you want it.

Patented advantages and high standard production make these three Marquette Specials ready sellers in every territory. They are feature lines that do not require a big investment and are a sure producer of good profits.

Quick shipment of orders and prompt attention to correspondence give dealer and jobber thoroughly satisfactory preferred service.

MARQUETTE MANUFACTURING CO., Inc.

St. Paul, Minnesota

Cuts, Descriptive Circulars, Window Cards, Posters, Etc., are available to every dealer that sells the Marquette Three Specials.

Two Stage Usaco Air Compressors

Mature investigation and deliberation will emphasize the wisdom of purchasing Two Stage De Luxe Air Compressors because, in them, the writer obtains:

High pressure Air in great volume, hence *capacity to quickly handle a large number of pleasure car tires* or *giant truck tires of any size or pressure.*

Pure air, without moisture or oil, for Usaco compressors have *both filtering trap and automatic air purifier, a new and valuable feature.*

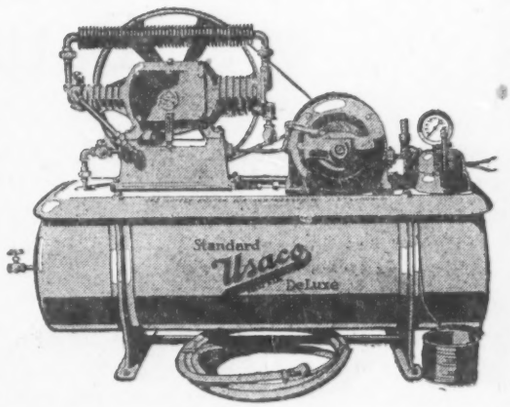
Capacity sufficient to accommodate rapid growth of business and *serve you faithfully,* with *minimum attention* and *freedom from repairs for years to come.*

An outfit that is *completely automatic* and *fool-proof* in operation because *safeguarded* against changing conditions and emergencies.

An outfit in which *the cause of burned out motors, blown fuses, etc., is definitely eliminated,* because equipped with the Usaco Patented Unloader which *permits motor to start without load.*

An outfit that *will not overheat* because it is amply lubricated and equipped with *numerous cooling fins* and *fan blade flywheel.*

An outfit selected as *the best available* by a majority of establishments, the *adopted standard of many international corporations,* the *Government's choice for war service.*

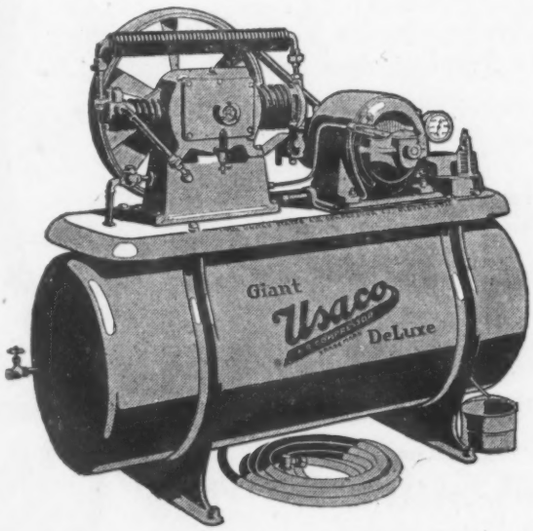


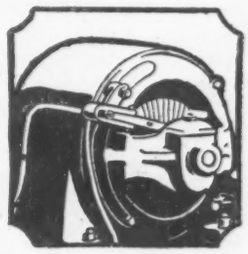
THE two Usaco De Luxe Air Compressors illustrated are the leading units of the Usaco Line, containing machines adapted for every existing need. They embody all the advantages mentioned and differ only in compressing ability and tank capacity.

The *Usaco Standard De Luxe* has a capacity of 4 Cu. Ft. per Minute, and a tank capacity of 30 gallons, suitable for 200 pounds working pressure.

The *Usaco Giant De Luxe* has a capacity of 7 Cu. Ft. per minute and a tank capacity of 60 gallons, suitable for 250 pounds working pressure.

Both units are also furnished mounted on wheels so that they may be easily moved to the cars or other departments, if desired.





Above is illustrated the Usaco Unloading Device, which all familiar with electric motors will appreciate as invaluable and in fact essential to satisfactory operation. It is obtainable only on Usaco Compressors because amply covered by Patents.

The United States Air Compressor Co.

6534 Carnegie Ave., Cleveland, Ohio

Announcing—

the

Westinghouse Rectigon Battery Charger

Charges the Battery in the Private Garage



The Westinghouse Rectigon is a simple, reliable and efficient automobile, or motor cycle, battery charger that charges from three to six cells, and that enables the car owner to keep his battery in constant normal condition. When batteries have been run down by evening or excessive driving, or by much starting, it is essential that the life of the batteries be prolonged by keeping them normally charged.

The Westinghouse Rectigon battery charger will do this for the car owner and will save him considerable time and money.

Easy operation.
Low cost.
Light weight
Westinghouse quality.

These are only a few of the many features that make the Westinghouse Rectigon preferable.

YOU CAN PROFIT BY SELLING RECTIGONS

Let us tell you about selling helps furnished, and how easy it will be for you to sell Westinghouse Rectigons. Write for descriptive leaflet F. 4416.

WESTINGHOUSE ELECTRIC & MANUFACTURING COMPANY
East Pittsburgh, Pa.
Sales Offices in All Large American Cities.

W
WESTINGHOUSE ELECTRIC

Westinghouse

Rectigon Battery Charger

Are You Satisfied to Be a 58% Fan Belt Dealer?





Fan Belt conditions have changed.

As a result of the many changes made by automobile factory engineers, new types of belts have come onto the market. Now, the 100% line of last year is only the 58% line this year.

Are you keeping up with this change? Are you handling the 58% line or the 100% line?

There's only one line on the market. Of over fifty manufacturers of fan belts, only one can offer you a complete standardized line to fit every car—endless flat belts, solid V-belts, and rolls of flat belting and laminated V-belting, all of known quality.

That's why practically every jobber in the United States and over 20,000 dealers have decided to handle one line—the Gates Vulco Cord—exclusively in 1920. They realize the importance of being in a position to handle 100% of the possible fan belt business.

The fan belt business is profitable. Every motorist who comes into your store buys a fan belt some time. He buys it from you or from your competitor.

Why let a customer of yours go to the car agency, or to the store across the street? If your competitor gets the business, it is because he has the 100% line—Vulco Cord—which is available to you, too.

Ask your jobber for the 100% standardized fan belt line.

GATES VULCO-CORD BELTS

"The Standardized Fan Belt"

Made by GATES Rubber Company Denver

ROMORT AIR STATION

EVERY GARAGE NEEDS ONE

Opinions of some of the most successful garage men from coast to coast blaze out the great truth that service to the car owner is the cornerstone of the successful garage business of today.

The new Romort Air Station has been designed and built with the one idea of enabling the garageman to render more perfect service to his regular and prospective customers.

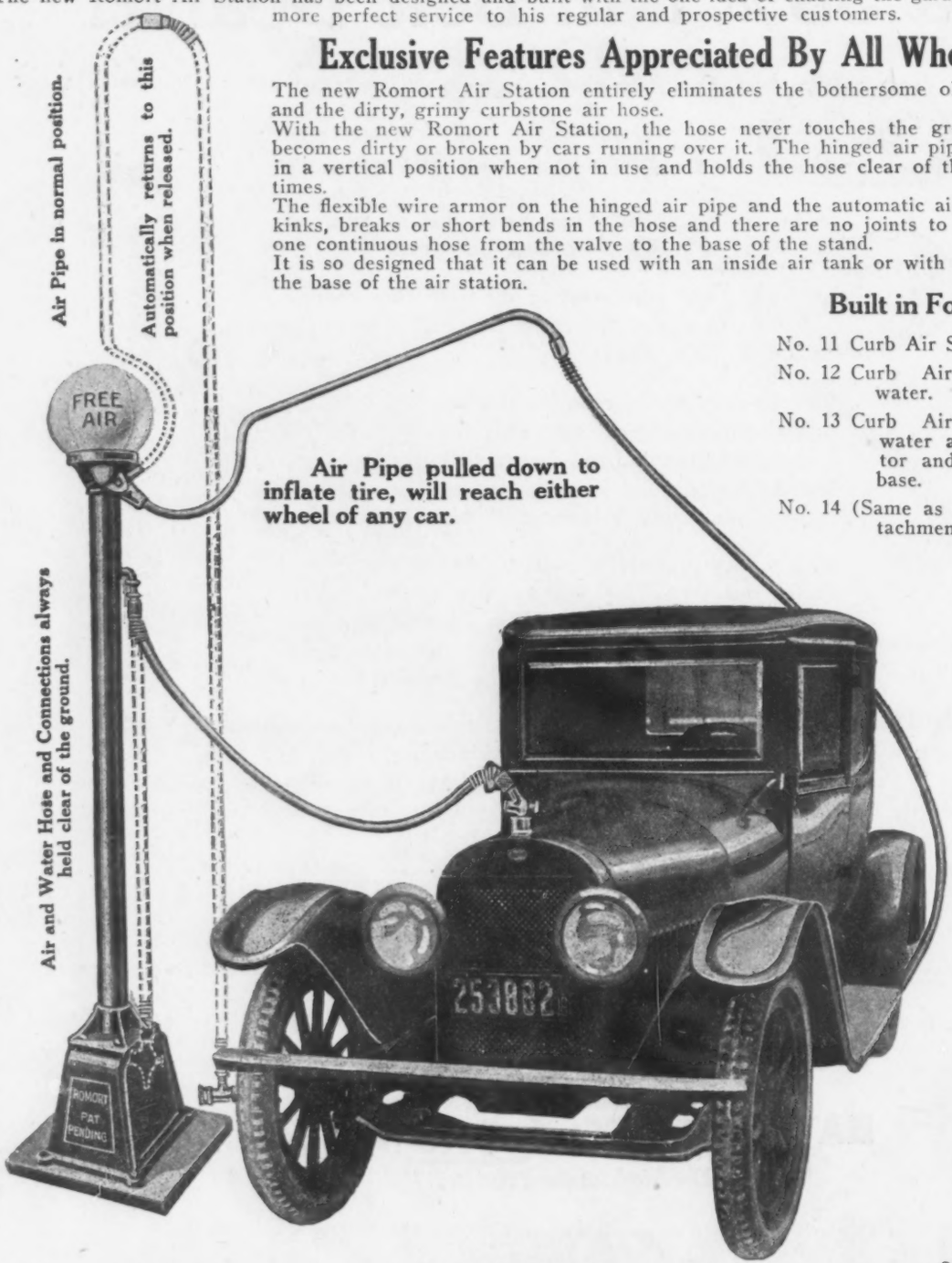
Exclusive Features Appreciated By All Who Know

The new Romort Air Station entirely eliminates the bothersome old water bucket and the dirty, grimy curbstone air hose.

With the new Romort Air Station, the hose never touches the ground and never becomes dirty or broken by cars running over it. The hinged air pipe always stands in a vertical position when not in use and holds the hose clear of the ground at all times.

The flexible wire armor on the hinged air pipe and the automatic air valve prevents kinks, breaks or short bends in the hose and there are no joints to leak as there is one continuous hose from the valve to the base of the stand.

It is so designed that it can be used with an inside air tank or with a compressor in the base of the air station.



Built in Four Styles

No. 11 Curb Air Station

No. 12 Curb Air Station with water.

No. 13 Curb Air Station with water and electric motor and compressor in base.

No. 14 (Same as 13 with pay attachment.)

Manufacturers

ROMORT MFG. CO.

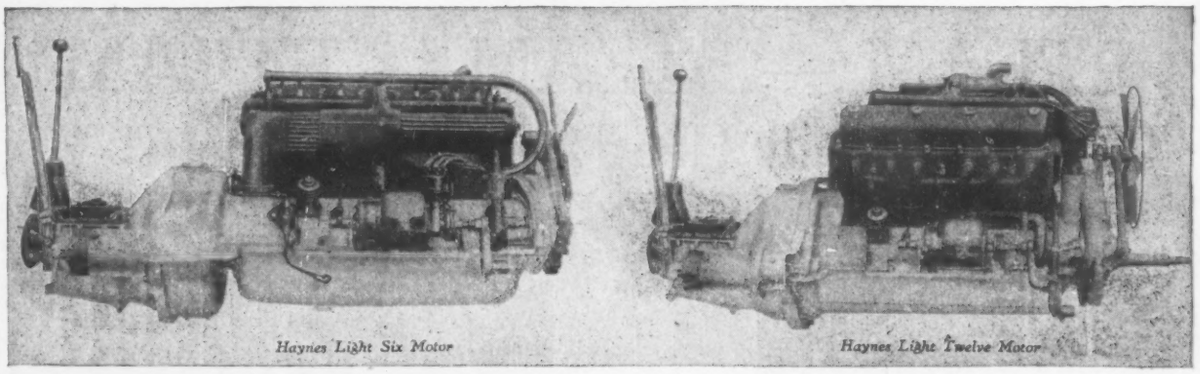
Oakfield, Wis.

Write us today for full details

Sales Dept.

THE ZINKE CO.

1328 Michigan Ave.
Chicago, Ill.



Haynes Light Six Motor

Haynes Light Twelve Motor

THE HEART *of the* NEW HAYNES
HAS AN ABUNDANCE OF VELVETY POWER



6 Cylinder Touring Car—7 Pass. $2685
12 Cylinder Touring Car—7 Pass. 3450



6 Cyl. Roadster—4 doors, 4 Pass. $2685
12 Cyl. Roadster—4 doors, 4 Pass. 3450



6 Cylinder Coupé—4 Passenger $3200
12 Cylinder Coupé—4 Passenger 4000



6 Cylinder Sedan—7 Passenger $3550
12 Cylinder Sedan—7 Passenger 4200

Cord tires wooden wheels standard equipment on all 6 cylinder cars. Cord tires and five wire wheels standard equipment on all 12 cylinder cars.

Prices are F. O. B. Kokomo

Attention Haynes Owners!

Special Sale of attractive ***Demountable Tops.*** If you drive one of the following Haynes models, write us for demountable top prices and details.

Model 33-T	Model 38-T
Model 35-T	Model 39-R (2 Doors)
Model 36-R (4 Pass.)	Model 39-R (4 Doors)
Model 36-T	Model 39 (5 Pass.)
Model 37-R (4 Pass.)	Mod. 39-T (long type)
Model 38-R (4 Pass.)	Model 44-T

Immediate Demountable Top Deliveries

HAYNES

America's First Car

THE Haynes motor has always been an integral part of the Haynes automobile—ever since Elwood Haynes, more than twenty-seven years ago created America's first car. A large part of the enviable reputation of the Haynes has been built upon the stamina and dependability of the famous Haynes motor. The Haynes motor is manufactured by experts in the Haynes factories.

Haynes engineers, profiting by twenty-seven years of experience, have from time to time developed improvements to the motor. Like the new Haynes itself, the Haynes motor is a token of the constant progress of automobile-making in which the Haynes has led.

Whether it is the Light Six or the Light Twelve motor, it is designed and perfected for its special functions. To secure the fullest power from the gasoline used, to transmit that power most effectively to the driving gear, to respond promptly and surely to the demands made upon it, to live and endure under all manner of usage, and constantly to give that confident, velvety power which is its distinguishing quality—these are the outstanding characteristics of the famous Haynes motor.

Prospective car owners may place their dependence upon the Haynes motor which carries with it an engineering record of twenty-seven years of unbroken advancement. The abundance of velvety power of the famous Haynes motor is the keystone of the four factors of character to be found in the new Haynes—beauty, strength, power and comfort. The Haynes car is 90% Haynes made in the mammoth Haynes factories which are devoted to the exclusive manufacture of fine automobiles.

A beautifully illustrated catalog, will be sent on request. Address Dept. 139

The Haynes Automobile Company, Kokomo, Ind., U. S. A.

The Haynes, AMERICA'S FIRST CAR, now exhibited by the Government at the Smithsonian Institution, Washington, D. C., was invented, designed and built by Elwood Haynes, in 1893.

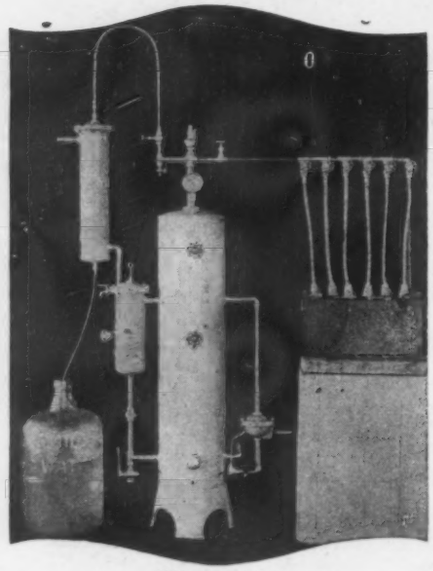
This advertisement copyrighted, 1920 by The Haynes Automobile Company.

1893—THE HAYNES IS AMERICA'S FIRST CAR—1920

STEAM — STEAM — STEAM

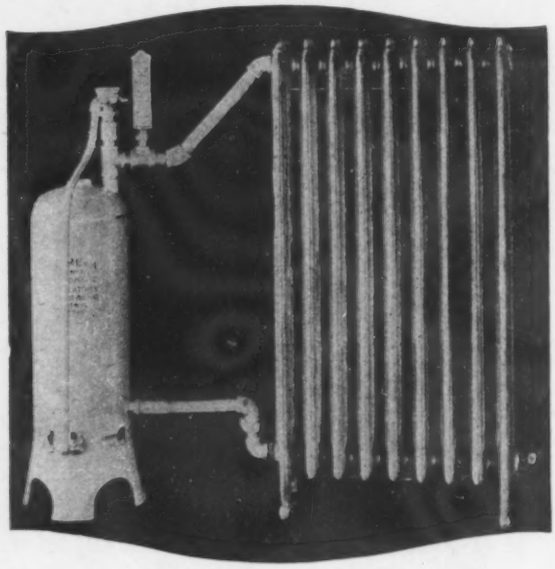
Get Up a Full Head of Steam for 1920

OR YOU WON'T BE IN THE RACE



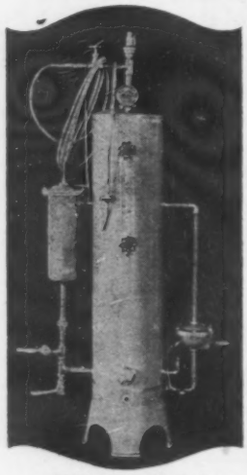
TYPE NO. 1

Are you going to operate a storage battery station and attempt to give service without this Eureka Automatic steam generator and water still? It has a capacity of 3 gals. per hr., at a cost of 1½c per gal., for distilled water and all the steam you want for opening purposes. **Ask us how to do it.**



TYPE NO. 2-B

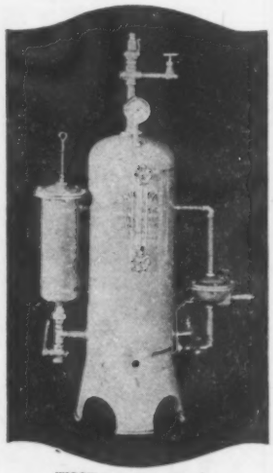
Keeping that private garage warm insures a perfect working motor, saves gasoline, etc., perhaps your customers have the old time stove, but that's a worry—the fire may be out, car frozen up. The Eureka will also heat your office, cottage or bungalo. Light it in the fall, put it out in the spring—low maintenance.



TYPE NO. 1-A

The only ideal method of cleaning rear axle housings, transmissions, motors, etc., is to use high pressure steam, eliminating the old time gasoline can and brush (the fire hazard). Factories use steam. You service stations and garages can have it, too, with the **Eureka No. A-1.** Does 4 times as much and better work at ¼ the cost.

The **ideal** steam generator for vulcanizers because you neither under cure or over cure casings or tubes — constant pressure maintained, capacity one to five moulds and one tube vulcanizer at the same time.

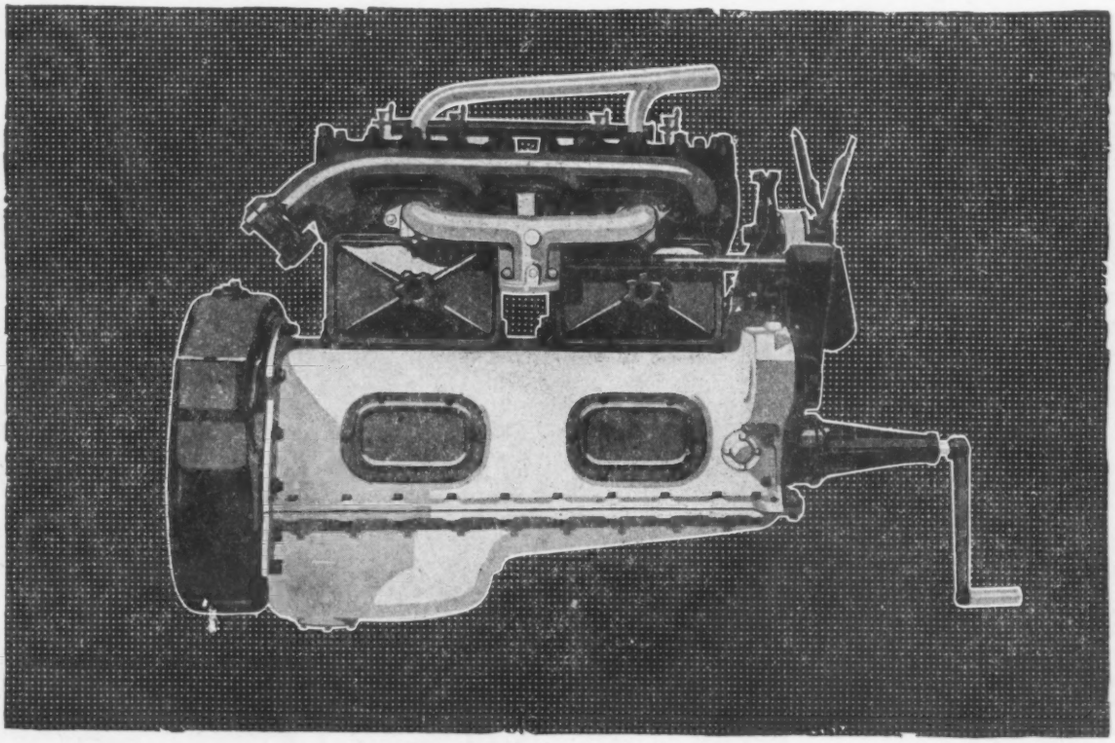


TYPE NO. 2-A

FULL INFORMATION FURNISHED UPON REQUEST—STATE TYPE INTERESTED IN

P. M. LATTNER MFG. CO.

Cedar Rapids, Iowa



Waukesha
TRADE MARK

HIGH TORQUE MOTORS

(Maximum Pull at Usable Speed)

More and more, truck owners are coming to realize the true relationship between high torque and performance, as exemplified by Waukesha engines.

Experience is teaching that maximum pull at usable speed is the only efficient and economical method of operating automotive equipment.

Such performance is based on high torque —on the ability of an engine to pull at average speed.

The old method of gaining maximum pulling power by operating a motor at excessive speed is not only costly but harmful.

Year after year Waukesha Motors have demonstrated by dominating performance and economy of operation, that the high torque principle embodied in their construction is unquestionably right.

The Truck or Tractor manufacturer who specifies Waukesha High Torque Motors, not only installs a power plant that will uphold the reputation of his product, but responds to the increasing public demand for dependable transportation.

WAUKESHA MOTOR COMPANY, WAUKESHA, WIS.

The World's Largest Builders of Tractor and Truck Motors Exclusively

ROTARY MIGHTY GOOD TIRES



TIRE DEALERS

Here's the Tire You're Looking For—and the Tire Motorists Want—

ROTARY

REAL SUPERSIZE

CORD **TIRES** FABRIC

And Pure Gum Red and Gray Laminated Tubes

The Rotary Tire & Rubber Company offers live dealers in open territories a most exceptional opportunity to secure exclusive distributing rights for the best cord and fabric tires and tubes on the market.

Rotary—real supersize—cord and fabric tires and red and gray laminated tubes possess the last word in talking points for the dealer and the utmost in wearing qualities for the user.

Every Rotary tire is a structurally perfect tire. They are built on collapsible cores which prevent distortion of the carcass and cured by **internal air** pressure instead of **external hydraulic** pressure.

If you are the livest dealer in your territory—and, if we are **not** already represented there—we can supply you **immediately** with any quantity of **Rotary cord and fabric tires.**

WRITE OR WIRE TODAY FOR INTERESTING DEALER PROPOSITION

NO OTHER MANUFACTURER OFFERS *YOU* SO MUCH! Maximum Discounts—Immediate Deliveries—A Waiting Market. Every Rotary Tire Sold Under the ROTARY GUARANTEE OF SATISFACTORY SERVICE.

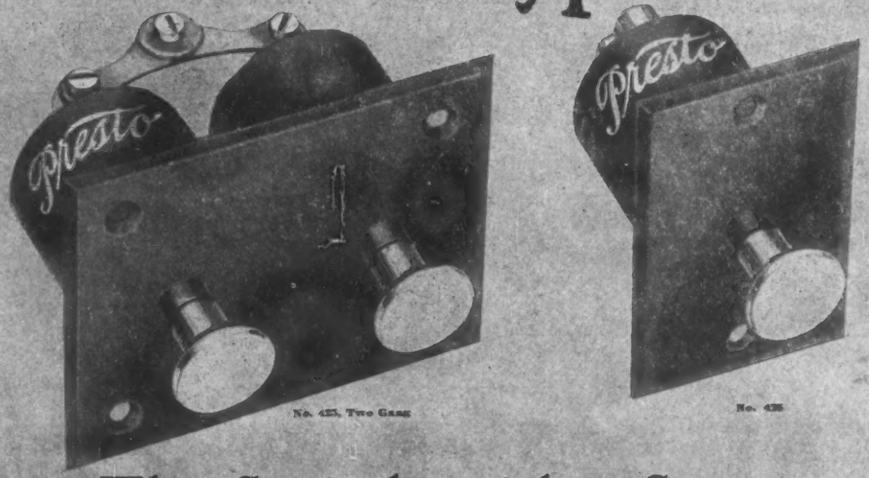
THE ROTARY TIRE & RUBBER CO.

ZANESVILLE, OHIO, U. S. A.

First in Service - Best in Quality

Presto

Push and Pull Type Switches



No. 425, Two Gang

The Switch with a Snap!

This latest Presto Product is a Push and Pull Type Switch of neat design and simple construction.

Several lamp manufacturers have already adopted this switch as standard euipment. Our production is accordingly large, and we are able to take care of all trade orders promptly.

Made in four different combinations—single, double, triple and quadruple styles. All body parts are made of steel—all switch parts are thoroughly insulated. The materials used will resist intense heat and will stand rough usage. Screw terminals and connection bars for the gang switches are provided.

The standard finish is black plate with nickel-plated knob. Each switch is packed in an individual carton, convenient for display and handling.

Your jobber will supply you. Write for full information on the Presto line of over one hundred motor car necessities.

Get Our Prices Before Placing Your Orders Elsewhere

Manufactured by

METAL SPECIALTIES MFG. CO.

338-352 N. Kedzie Avenue Chicago, Illinois

Eastern Branch - - - - - - 16-24 W. 61st St., New York

Manufacturers of

Presto Products

A LINE OF OVER 100 MOTOR CAR NECESSITIES

PETERS' METALLIC FILLER

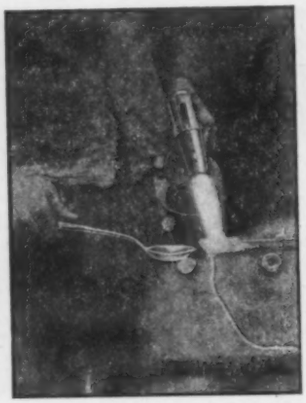
(NICRO SPELTER)

for cracked castings of iron, steel, brass or bronze

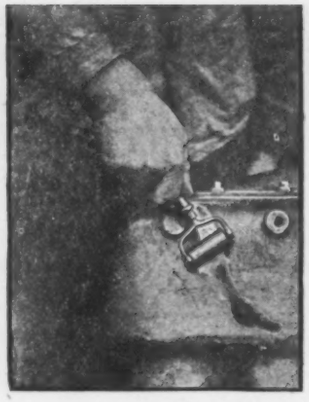




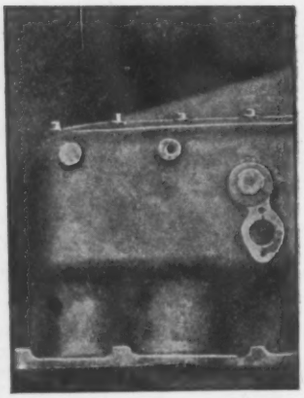
You first clean the crack thoroughly and bevel the edges.



Then heat for a moment with an ordinary hand torch (300 degrees ample) and apply the filler.



While the hot metal filler is still soft, pack and roll it smooth.



Allow to cool for five minutes, dress off with a file, and the job is done.

!! WORKS AT 300° F. !!

FORMS A PERMANENT, WEAR RESISTING BRAZE

THE GREAT VALUE of Peters' Metallic Filler lies in the ease with which brazing can be accomplished—broken cylinders can be mended without dismantling or removing the engine and with full assurance that there will be no danger of warping the bore or changing the alignment.

The discovery of Peter's Metallic Filler replaces the old method of brazing whereby the casting must be heated to a cherry red with all the consequent dangers of cracking, distorting and warping.

Likewise it renders obsolete the old process of welding which required slow preheating and subsequent annealing.

Peters' Metallic Filler is a *Metal.* It is not a cement or a paste. It makes a *permanent repair.*

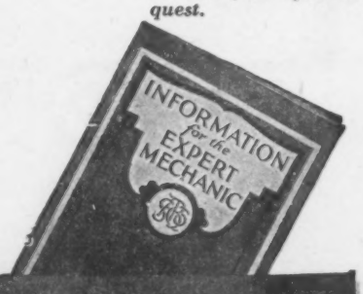
Peters' Metallic Filler is quick, efficient and inexpensive. It is the modern method of brazing and has won highest recognition and praise wherever used.

Large size repairmen's package $5.50, consumers' package $3.00.

If your dealer does not have it, order direct.

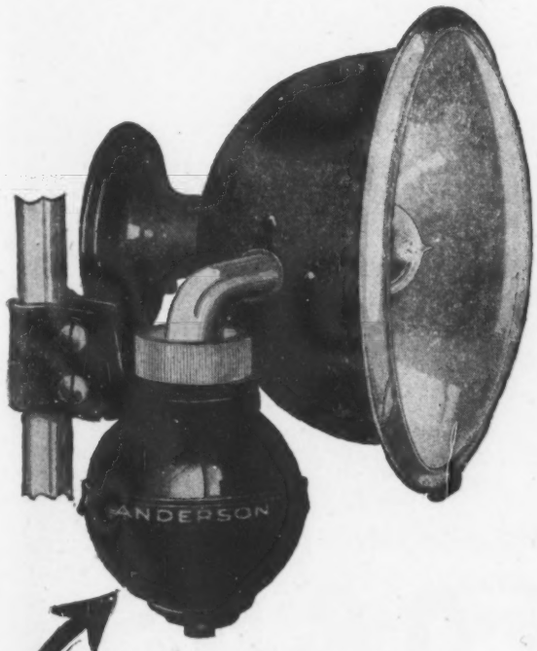
ALUMINUM BRAZING SOLDER CO.
Widener Bldg., Philadelphia, Pa.

An interesting and valuable booklet "Information for the Expert Mechanic" will be sent free upon request.



Autoreelite

The Motorist's Best Friend



No Touring Car for 1920 is complete without an Autoreelite.

An absolute essential piece of equipment for driving at night.

The *only* combined windshield spotlight and trouble-light.

The 12-foot extension cord and reel are contained in the small, neat, waterproof ball casing attached to the bracket.

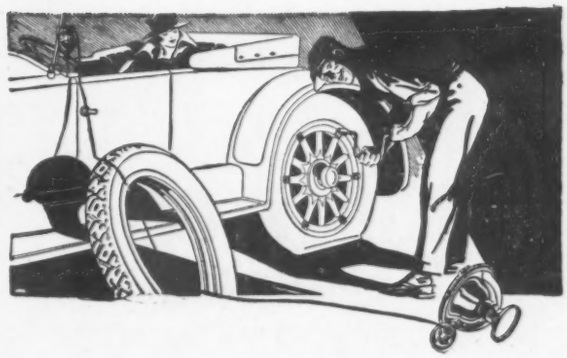
This feature is found only in the Autoreelite

Model B-6, 6-in. diameter, 20 c. p. lamp, with rear view mirror $9.00

Model B-7, 7-in. diameter, 32 c. p. lamp, with rear view mirror $10.00

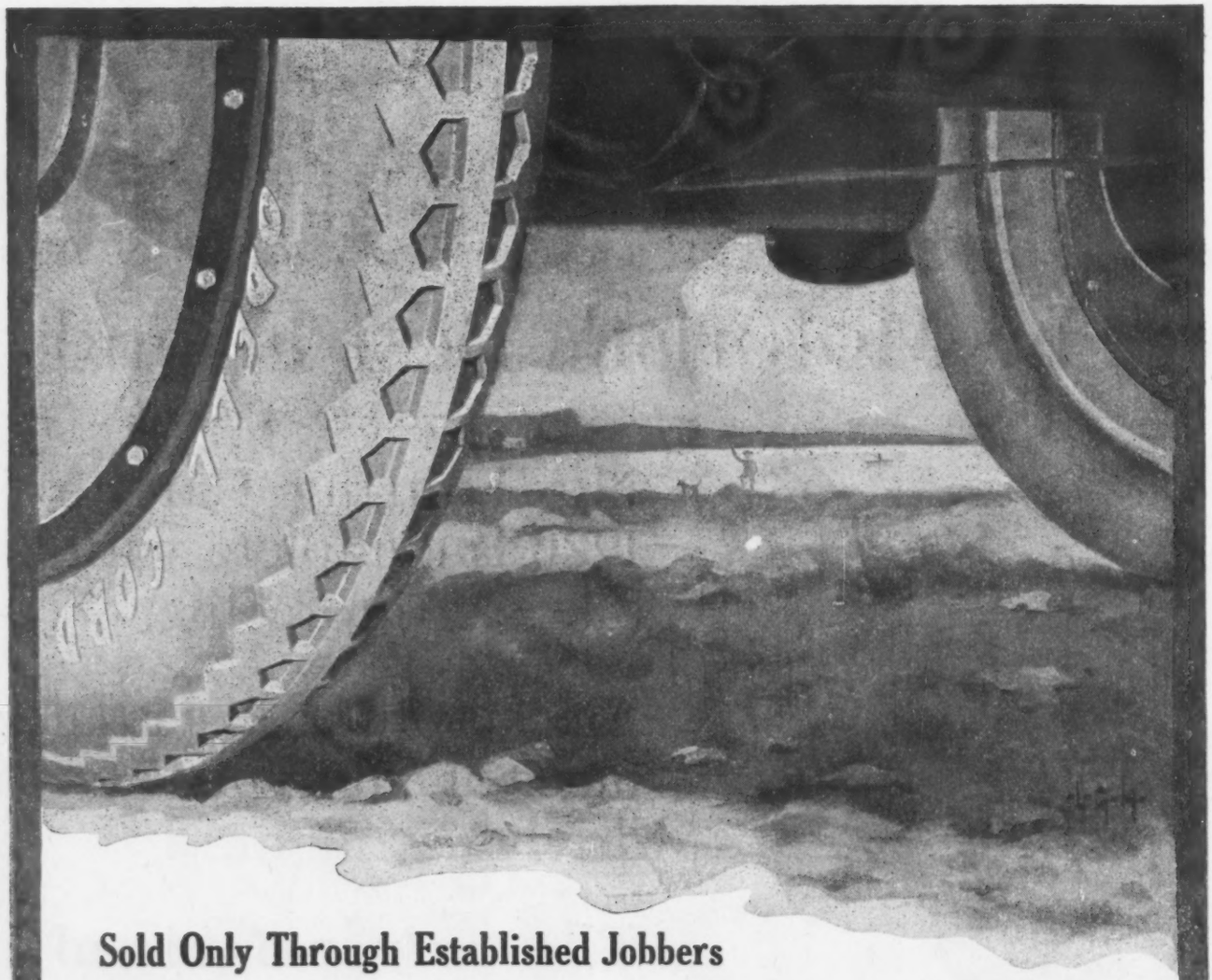
Sport model, all-nickel, with rear view mirror . . $15.00

From the best dealers and supply houses.



Write for Booklet No. MA-301

Anderson Electric Specialty Company
118-124 South Clinton Street **Chicago, Illinois**



Sold Only Through Established Jobbers

ODELL CORDS

"Built First to Last"

ODELL CORD Tires are made in regular sizes and *standard* oversizes only.

As every dealer knows, the *full and true* oversize for a 34 x 4 (for example) must measure 35 x 4½. The buyer of an ODELL CORD, desiring a 34 x 4 "oversize" does not ask for a 34 x 4 oversize but gets a full, true oversize for 34 x 4 simply by asking for exactly what he wants—35 x 4½.

No wrenching and straining of the differential and chassis, easier riding and more mileage—all these advantages are offered by ODELL CORDS through their rigid conformity to original *fabric* size standards and *standard oversizes* which insure perfect balance and perfect distribution of the car's weight.

Full information upon request. Address your own jobber or write direct to us.

SOUTH BEND FABRICS

Rough and Ribbed Tread

Manufactured by hand by the "slow" process and representing a quality with which no machine-made tire can compare.

Guaranteed 7,000 miles

INTERNATIONAL INDIA RUBBER CORPORATION, SOUTH BEND, IND.

Putting the Service Station on a Money-Making Basis

The automobile dealer has long complained of the profits lost in rendering the necessary satisfactory service to car owners. This has especially been the case during times when the dealer was unable to obtain new cars, and service had to be given despite the very few new car sales. However, the transforming of the unprofitable repair shop into a money-making asset is now a very simple matter with the Fairbanks Service Station Equipment Line.

To meet the need for labor saving tools in the service station, The Fairbanks Company has developed a line of these devices which provides for every class of automobile repair.

A concrete example of the savings which result from the use of this equipment is that five to fifteen hours' time may be saved on a bearing overhaul job alone. This, and every other point claimed for the entire line is backed by the "FAIRBANKS O.K."

See our exhibit at the Chicago Automobile Show, Coliseum and First Regiment Armory, January 24th to 31st

THE FAIRBANKS COMPANY

Administration Offices—NEW YORK

BRANCH HOUSES

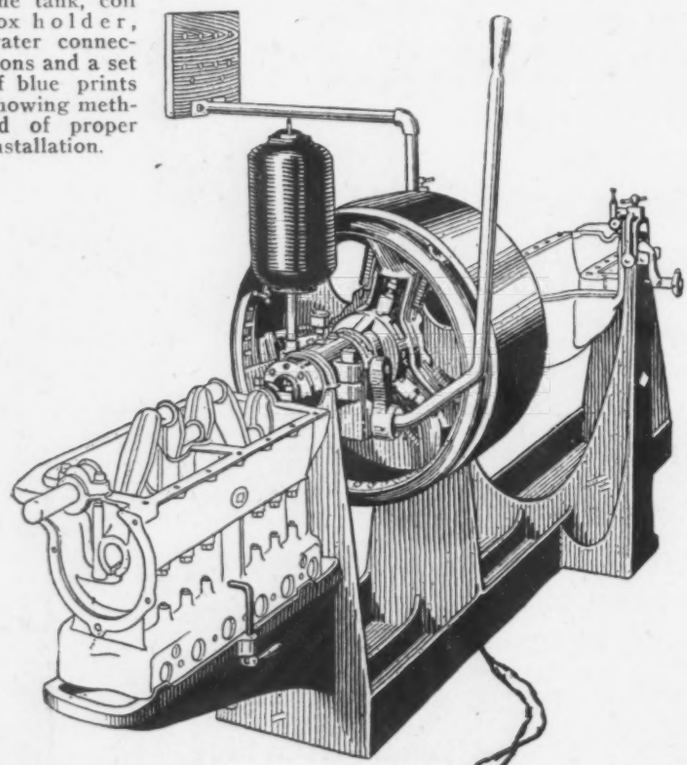
Albany	Buffalo	New York	Rochester	Birmingham, Eng.
Baltimore	Chicago	Paterson	Scranton	Havana, Cuba
Birmingham	Detroit	Philadelphia	St. Louis	London, England
Boston	Hartford	Pittsburgh	Syracuse	Glasgow, Scotland
Bridgeport	Newark	Providence	Utica	Paris, France
	New Orleans		Washington	

FAIRBANKS O.K.

American Junior Combination Bearing Burning-in, Motor Test and Running-In Stand.

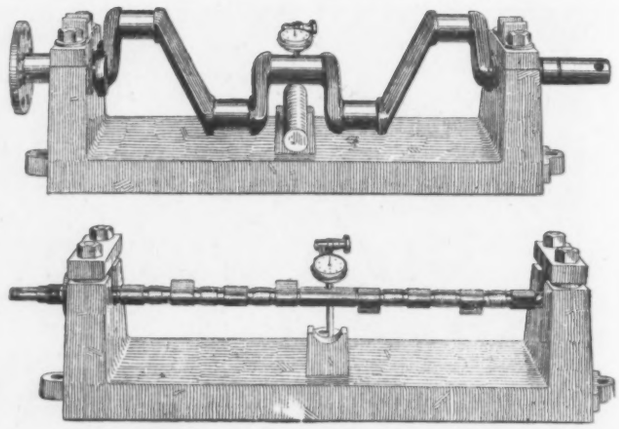
Saves 5 to 7 hours over the hand-scraping method in renewing a set of Ford Motor bearings. Gives to bearings a 95% bearing surface.

$197.50 F.O.B. Chicago, including gasoline tank, coil box holder, water connections and a set of blue prints showing method of proper installation.



$197.50
F. O. B. Chicago





Combination Alignment Machine for Crank Shafts and Cam Shafts.
Price $40.00

Fairbanks Equipment

for

Service Stations

Some Service Stations are doing more work, giving better satisfaction and making more profits.

Why?

Because they are using Fairbanks labor-saving and profit-making machines and tools.

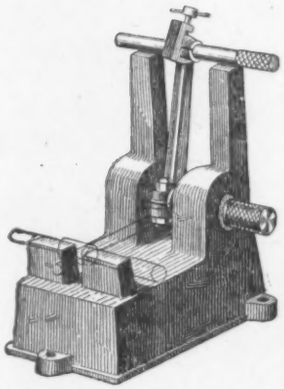
These machines and tools eliminate all unnecessary work and permit the mechanics to get at the parts to be repaired in surprisingly short time.

FAIRBANKS

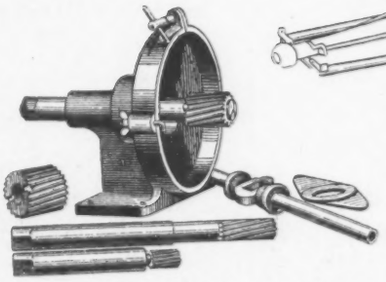
Sole Distributors for the SERVICE STATION EQUIPMENT CO. and other manufacturers of garage equipment.

O.K.

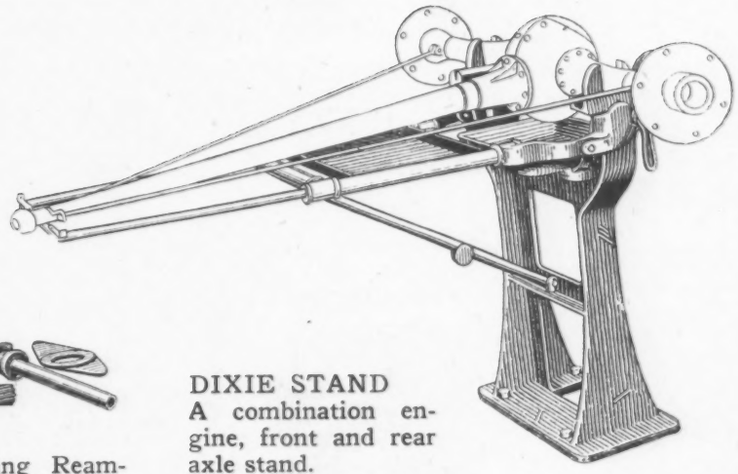
MILL, MINE AND RAILWAY SUPPLIES, SCALES, VALVES, POWER TRANSMISSION, TRUCKS AND WHEELBARROWS MACHINE TOOLS, ENGINES AND PUMPS, AUTOMOBILE AND SERVICE STATION EQUIPMENT



Connecting Rod Alignment Machine. Price $30.00



Transmission Bushing Reaming Machine. Price $72.00



DIXIE STAND
A combination engine, front and rear axle stand.
Price $60.00

Sold under "The Fairbanks Company O. K."

There is a piece of equipment for every need.

And remember all of these machines are guaranteed by the "Fairbanks O.K." This is your protection. Use it to its fullest value.

Write to the nearest Fairbanks Branch House for catalog illustrating and describing each tool listed on this page.

THE FAIRBANKS COMPANY
Administrative Offices: NEW YORK

BRANCH HOUSES

Albany	Buffalo	New York	Rochester	Havana, Cuba
Baltimore	Chicago	Paterson	Scranton	London, England
Birmingham	Detroit	Philadelphia	St. Louis	Birmingham, England
Boston	Hartford	Pittsburgh	Syracuse	Glasgow, Scotland
Bridgeport	Newark	Providence	Utica	Paris, France
	New Orleans		Washington	

Listed below are many other labor-saving and profit-making machines and tools which should interest every Ford Service Station owner. All of these machines and tools are sold under "The Fairbanks O.K."

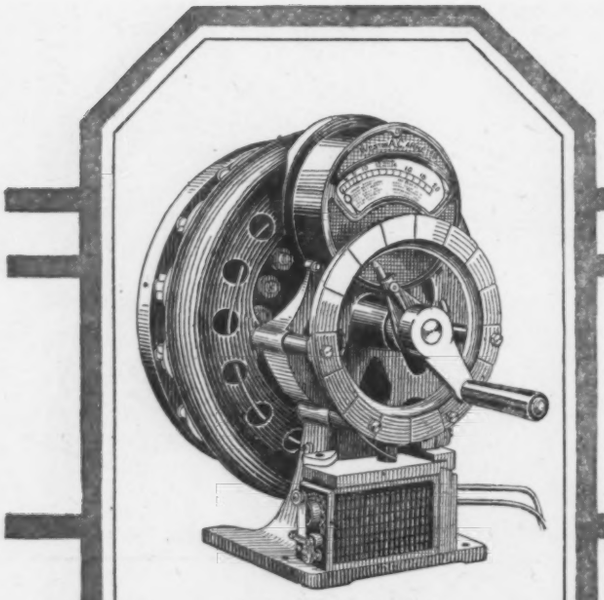
- Bearing Burning-in Machines
- Motor Test Stands
- Rear Axle Test Stands
- Axle Sleeve Pullers
- Turning Bars
- Bench Motor Clamps
- Piston Clamps
- Special Jacks and Trucks
- Cylinder Boring Machines
- Re-Babbitting Jigs
- Air Compressors
- Transmission Reaming Machines
- Bushing Drivers
- Rim Tools
- Pneumatic Valve Grinders
- Radiator Test Plugs
- Connecting Rod Alignment Machines
- "L" Wrenches
- Speed Wrenches
- Reamers
- Straightening Presses
- Arbor Presses
- Power Grinders
- Tractor Tools and special machinery for Ford and Fordson
- Electric Test and Repair Devices
- Radiator Repair Sets

FAIRBANKS

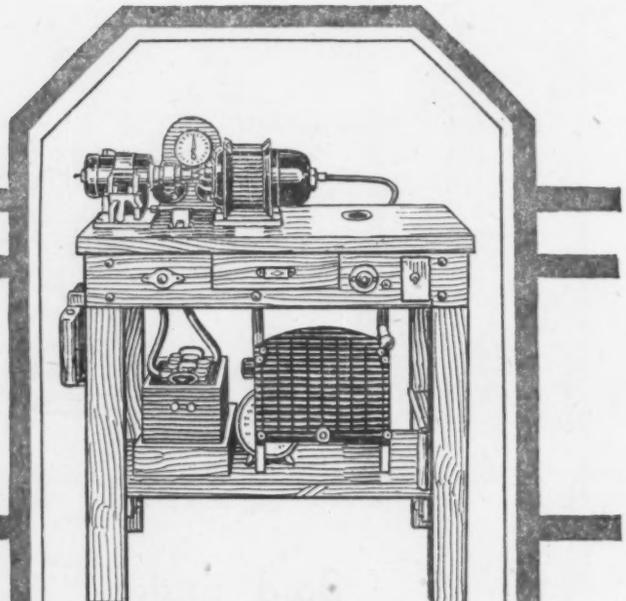
Sole Distributors for the SERVICE STATION EQUIPMENT CO. and other manufacturers of garage equipment.

O.K.

MILL, MINE AND RAILWAY SUPPLIES, SCALES, VALVES, POWER TRANSMISSION, TRUCKS AND WHEELBARROWS
MACHINE TOOLS, ENGINES AND PUMPS, AUTOMOBILE AND SERVICE STATION EQUIPMENT



Fairbanks Coil Unit and Magneto Test Stand



The F-B Test Stand

How to Improve Your Modern Service Station

Your repair shop with its labor saving machines makes short work of overhaul jobs on motors, axles, and transmissions. To improve it install equipment that will locate and repair your ignition, lighting and starting troubles.

The Fairbanks line of electrical service station equipment fills this need completely and is backed by the well known Fairbanks O.K.

No matter what your battery charging requirements are there is a Fairbanks Charging Outfit that will meet them efficiently and economically.

The vertical Motor-Generators, used, have established a new standard of perfection in their ball bearing construction, low operating temperature, freedom from vibration, and automatic lubrication.

The switchboard framework is arranged so that other separate units may be added as desired. Thus your installation grows with your business.

The paralleling switches at the bottom of the panel permit charging at double rate for any desired time shortening the charging time to meet urgent requirements.

Generator and starting motor troubles are completely taken care of by the F-B Stand. The various units may be tested under conditions identical with those in actual use on the car, easily and quickly locating any defects.

Install this equipment and be prepared to meet every demand in the electrical repair line. This means more profits, time saved, and customers satisfied by modern service.

There is a Fairbanks Branch House near you. Send for Catalog 8—better yet, drop in and see these devices in operation.

THE FAIRBANKS COMPANY

Administrative Offices—NEW YORK

BRANCH HOUSES

Albany	Buffalo	New York	Rochester	Havana, Cuba
Baltimore	Chicago	Paterson	Scranton	London, England
Birmingham	Detroit	Philadelphia	St. Louis	Birmingham, Eng.
Boston	Hartford	Pittsburgh	Syracuse	Glasgow, Scotland
Bridgeport	Newark	Providence	Utica	Paris, France
	New Orleans		Washington	

FAIRBANKS

Sole Distributors for the Service Station Equipment Company, the Hempy-Cooper Manufacturing Company, the Peterson Engineering & Manufacturing Company, The F-B Electric & Mfg. Company, The Steere-Kitson Company and other manufacturers of garage equipment.

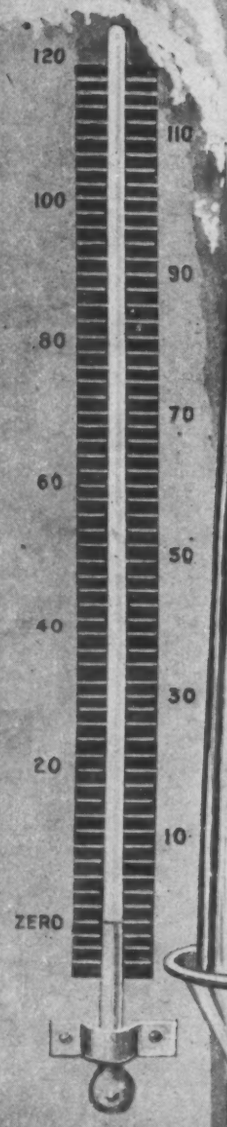
O.K.

SUPREME AUTO OIL

FLOWS FREELY AT ZERO

COLD WEATHER LUBRICATION



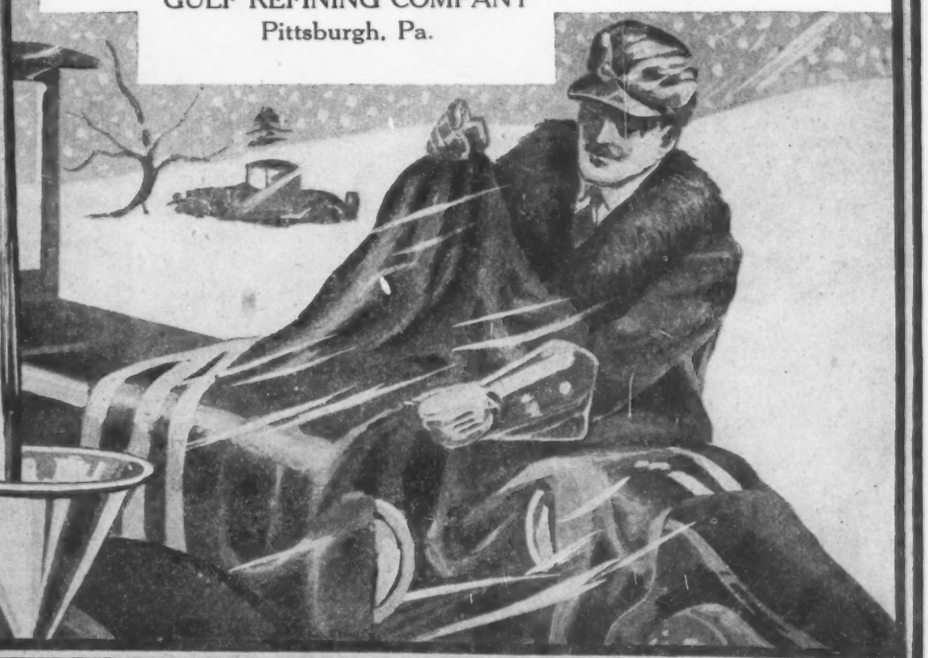


THE blanket won't protect your crankcase—but it will need no protection if filled with

SUPREME AUTO OIL

See your Dealer

GULF REFINING COMPANY
Pittsburgh, Pa.



SPACKE

Ten Grease Cups Eliminated



Increased Facilities Permit Immediate Deliveries In Quantity—

The Axle Which Combines Better Design, Materials and Construction

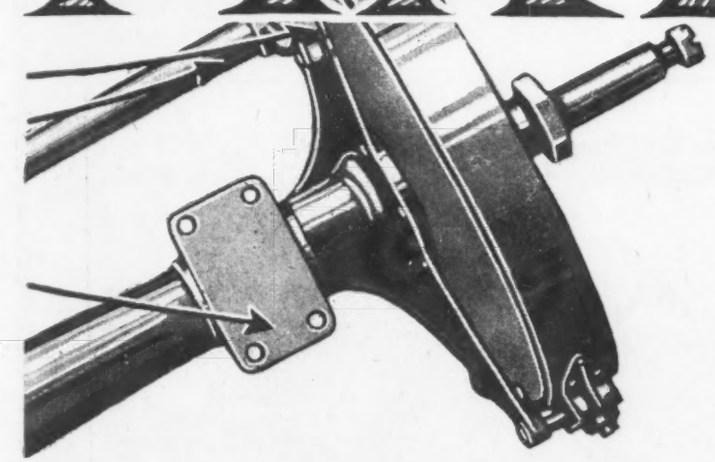
Rigid, compact, light-weight housings — welded and riveted.

Selected Chrome Nickel Steel Axle Shafts.

Simplified construction of Sturdy Brakes, eliminating many small parts, springs and clips —thumb screw adjustment.

Standardized Special Differential with simple accessible bearing adjustments.

AXLES



Performance or Price?

Which factor shall determine your selection of axle equipment for your next car?

Pride of ownership is the greatest asset any motor car manufacturer or dealer can have. Pride of ownership is based on **performance in actual service.**

Spacke Axles' nation-wide reputation for superiority is builded on **performance.** Simple, sturdy Spacke Axles, giving satisfactory service in hands of users everywhere, have created confidence, and more—a greater demand for Spacke Axles—front and rear. Car buyers have learned of Spacke plus-quality by personal experience.

Extra factors of **safety,** long life and "kid-glove" adjustments are assured in Spacke Axles by simplicity of design, finest quality of material and superior quality of workmanship. The flawless workmanship is the result of accumulated skill gained from the manufacture of 200,000 axles in two great factories.

Do not slight **your** car! Insist upon Spacke Axles—front and rear.

Send for the Spacke Specification Folder—NOW!

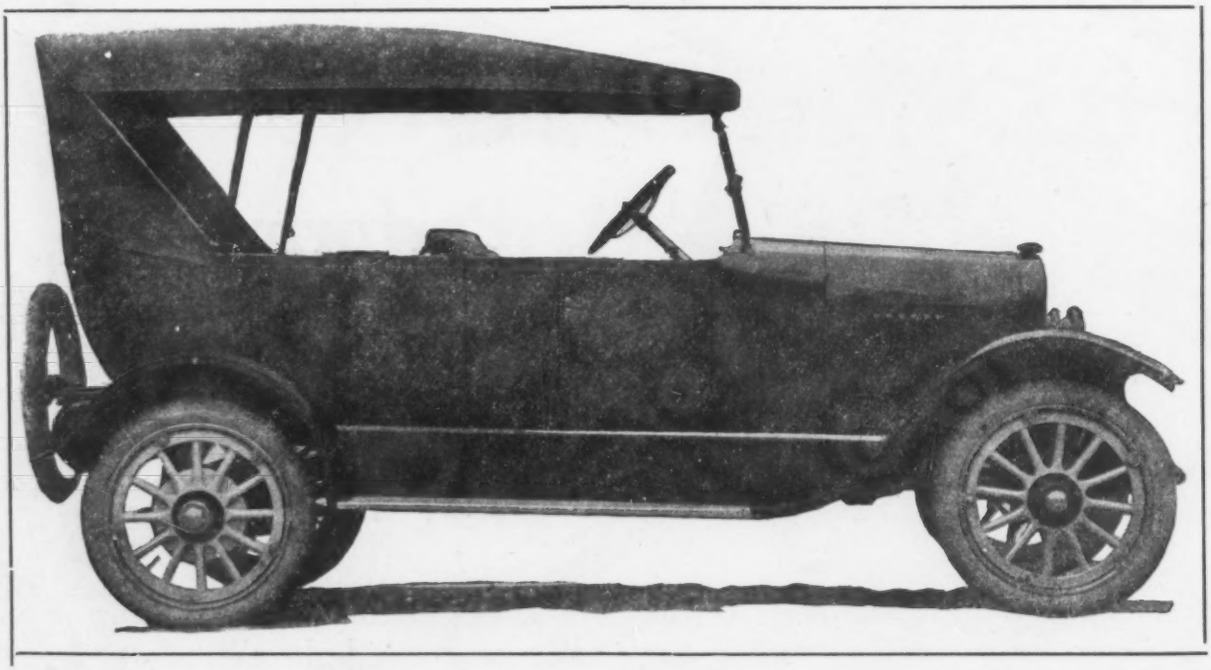
THE SPACKE MACHINE & TOOL CO.

Makers of Spacke Axles, Spacke Motors & Automotive Parts

Factories & Offices - - - - - Indianapolis-U-S-A.

Seneca MOTOR CAR

"Built For The Owner"



Light—Beautiful—Sturdy—Flexible
Simple—Accessible

These six words tell the major portion of the Seneca story. Anything further we may say is merely in explanation of these six big points.

From the standpoint of the owner himself—and after all, he's the fellow who counts—the Seneca meets his every requirement in a motor car. Heavy enough for ease in riding; light enough for economy in gasoline and tires; luxurious enough for the most discrimination, and priced within the reach of anyone.

SPECIFICATIONS:

MOTOR—LeRoi four cylinder motor, 27 horsepower, 3⅛-inch bore, 4½-inch stroke.

LUBRICATION—Combination pump and splash, oil pump of a positive plunger type.

COOLING—Thermo syphon. Large inlet and outlet Cellular radiator.

IGNITION—Connecticut vertical distributor integral with engine, with storage battery floating in the line.

STARTING AND LIGHTING—Allis-Chalmers simplified one unit starting motor and generator driven by enclosed silent chain, 94 ampere hour Presto-Lite Storage Battery.

CARBURETOR—Schebler Model "R" one-inch single jet with hot air connection to exhaust manifold.

TRANSMISSION—Selective sliding, three speeds forward and reverse. 3½% nickel gears.

CLUTCH—Barge & Beck dry disc type.

SPRINGS—Front semi-elliptic, six leaves, 36 inches long, 1¾ inches wide. Rear: eight leaves, 51 inches long, 2 inches wide. True Cantilever of special alloy steel attached to rear axle on oscillating spring seat.

WHEELBASE—108 inches. Tread 56 inches.

FRAME—Special pressed steel 4-inch channel, 5/32 inch thick.

BODY—Stream line yacht type, five passenger touring. Deep upholstering with flexible back springs and cushions. Standard color—Brewster green with black chassis and chrome yellow wheels.

EQUIPMENT—Full set tools, tire removing tools and repair kit, jack, pump, robe, rail, foot rail, Stewart speedometer, horn, extra demountable rim, ventilating windshield, one man top and boot and side curtains.

MILEAGE—25 miles to gallon of gasoline.

PRICE $1085

DEALERS wanted in your territory—wire or write for particulars.

SENECA 1,000 LB. DELIVERY CAR

DEALERS: The chassis of this car is the same as in the touring car except that the gas tank is under the seat. For quick, dependable delivery this light weight sturdy delivery car gives wonderful service at a ridiculously low cost.

SENECA MOTOR CAR COMPANY,
Dept. 101, FOSTORIA, OHIO

FIFTH SUCCESSFUL YEAR

HENDERSON TIRES

Utmost In Tires

6,000-Mile standard guarantee

More resilient

Slower wearing

Built by experts who have been making famous tires for years

Moderate priced

Fair profit to distributer

Exclusive franchises

Comprehensive advertising

International distribution

Service

A business policy that is ironclad with fairness to consumer and distributer

Write us, advising the territory that interests you.



HENDERSON TIRE & RUBBER COMPANY

40 Exchange Place,
New York City.

Factory,
Columbus, O.

DUTCH BRAND PRODUCTS

TRADE MARK

Every Chemical Need for the Automobile

This group illustrates only a few Dutch Brand Products. Our new 1920 book, "Keeping Down the Up-Keep," shows them all.

Radiator-Seal
Auto Patching Cement
Sure-Seal Patch
Rubber-Seal
Vulcanizing Cement
Carbo-Cide
Valve Grinding Compound
Auto Top and Cushion Coating



Gasket Shellac
Varni-Brite
Auto Polish
Tire Talc
Friction Tape
2 in 1 Tire Cut Filler

THE NATIONAL REPUTATION OF DUTCH BRAND PRODUCTS IS A BUSINESS ASSET FOR YOU

In thousands of stores throughout the country **Dutch Brand Products** are the dominant sellers on dealers' shelves. **Dutch Brand Products** have been on the market for years—they are known to the motoring public—their reputation is based on the solid foundation of satisfactory service.

There is a demand for every product in the line—each is a "best seller." For years, we have been studying the market. We know what is wanted, what is needed—and that's why we say you cannot make a mistake in stocking **Dutch Brand Products.** Whether it be winter or summer you will enjoy a steady stream of **Dutch Brand** sales. **Dutch Brand Products** are so quick and easy for you to handle. Rapid turnover, increased profits make these fine shelf goods especially desirable.

This line has national distribution. Jobbers everywhere know and stock **Dutch Brand Products.** It is hard to find a town where these products are not sold.



DUTCH BRAND
SURE-SEAL
SELF CURING PATCH

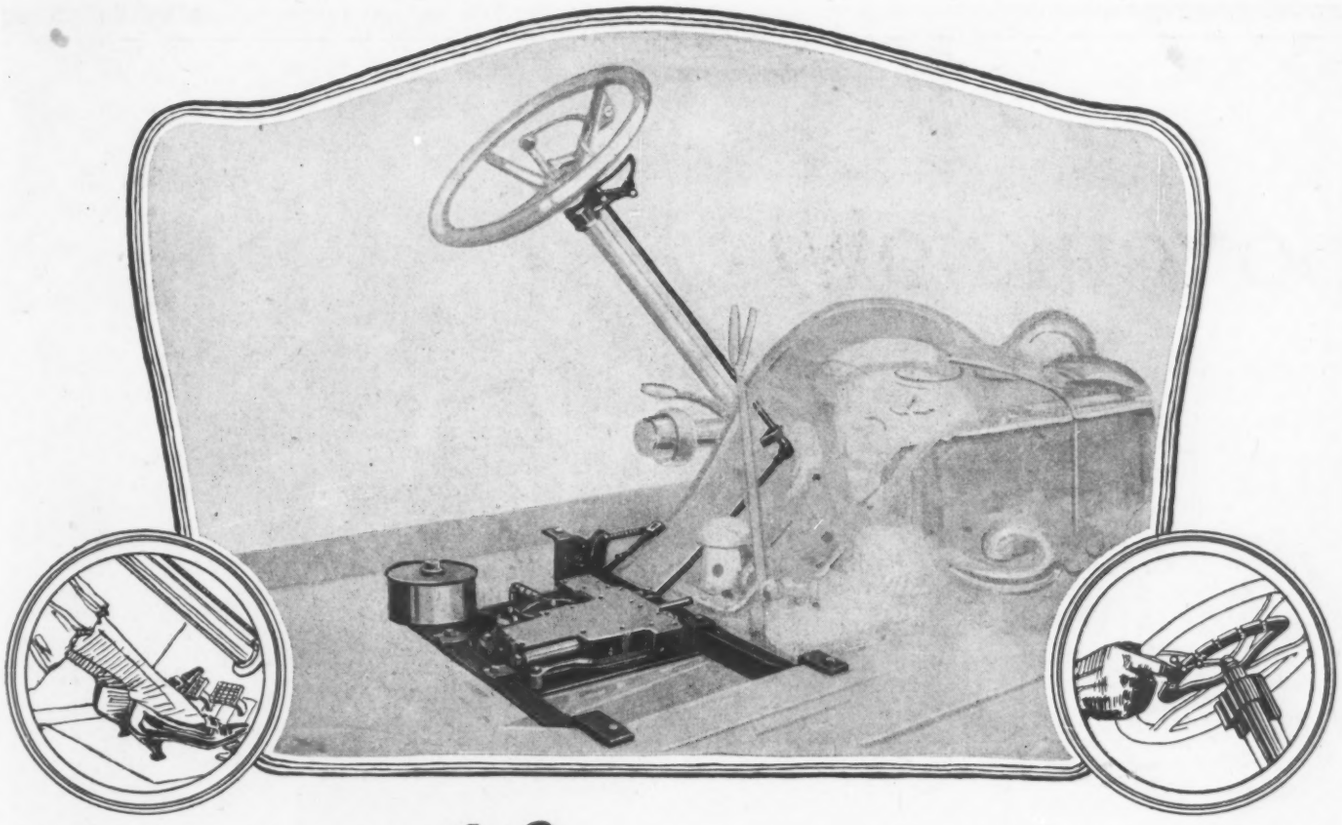
Sure-Seal repairs **permanently** and in a few minutes all punctures and blowouts in tubes. It is self curing—requires no heat or acid. Simple, quick and easy to use—eliminates troubles and delays incident to touring. Repairs anything made of rubber. Order a stock from your jobber.

This message has a big meaning for **you**—a meaning interpreted in terms of more attractive profits.

A catalog illustrating and describing the complete line will be sent to you on request. Write for it.

Jobbers: If you haven't taken your place in the chain of Dutch Brand national distribution, a word from you will bring our representative.

VAN CLEEF BROS.
Manufacturers Dutch Brand Rubber Cements and Auto Chemical Specialties
7701-7711 Woodlawn Ave. " " " Chicago, Illinois



Laursen

HYDRAULIC GEAR SHIFT
U.S. PAT.

SHIFTS GEARS AUTOMATICALLY

Ten Reasons Why the Laursen Hydraulic Gear Shift is Now the Accepted Method

1—It gives you automatic gear shifting—you indicate the change of gear by a touch of your finger, then push the clutch—that's all.

2—Removes the last barrier to perfect driving joy—the work and nervous strain of shifting gears by hand.

3—Makes your gas car as easy to drive as an electric.

4—Removes the gear lever permanently.

5—Enables two or three persons to occupy the front seat, comfortably, without interfering with control of the gears.

6—Absolutely prevents gear stripping—a thing always possible with hand shifted gears, and the constant fear of beginners.

7—Prolongs the life of your car by eliminating guesswork in making a shift, and the consequent grinding wear and shock to the transmission and the co-ordinating part.

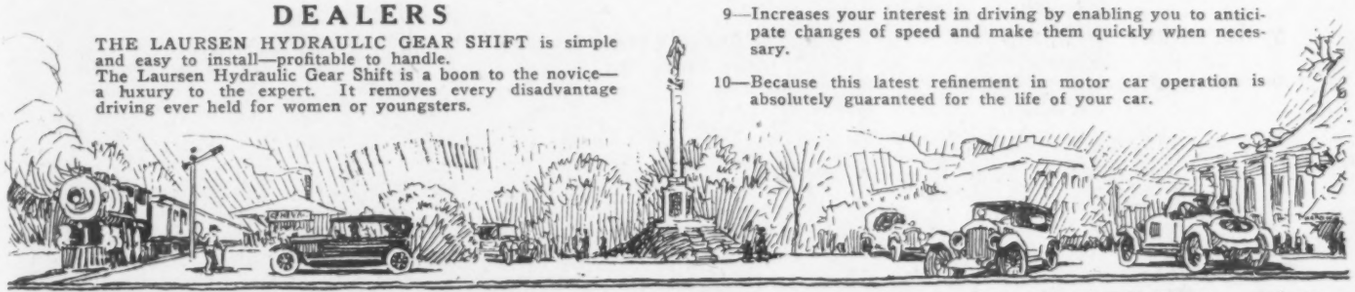
8—Reduces possibilities of accidents by enabling you to have the use of both hands for steering and emergency action.

9—Increases your interest in driving by enabling you to anticipate changes of speed and make them quickly when necessary.

10—Because this latest refinement in motor car operation is absolutely guaranteed for the life of your car.

DEALERS

THE LAURSEN HYDRAULIC GEAR SHIFT is simple and easy to install—profitable to handle.
The Laursen Hydraulic Gear Shift is a boon to the novice—a luxury to the expert. It removes every disadvantage driving ever held for women or youngsters.



UNITED STATES AUTO GEARSHIFT CO.

1458-SO. MICHIGAN AVE., CHICAGO.

GENERAL OFFICES 122-SO. MICHIGAN AVE., CHICAGO.
FACTORY - EAU CLAIRE, WISCONSIN.

DO YOU KNOW?

Several well-known cars obtain a very high mileage per gallon of gasoline as they have proved by numerous official tests.

BUT

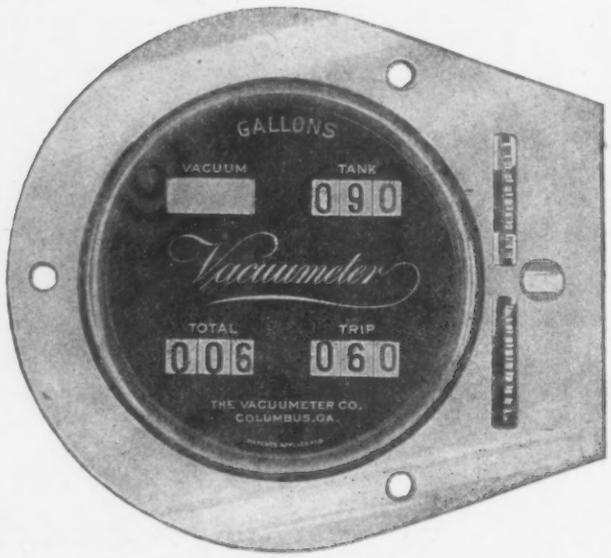
The average owner of these cars can only approximate roughly whether or not his own car is getting the mileage per gallon it should. Do you *know* how many miles per gallon you get?

With a Vacuumeter you can tell exactly and at all times and can absolutely check the performance of your car. It is a real index of motor performance as weak ignition, formation of carbon, or imperfect carburetor adjustment will show in decreased mileage per gallon long before they show from other sources.

The Vacuumeter is a simple self-contained instrument mounted on the dash or instrument board and having but one connection (a copper tube) with the vacuum system. It shows at all times four cardinal factors of motor performance (1) whether the vacuum system is working properly; (2) gallons and tenths of fuel used per trip; (3) gallons used per season; and (4) gallons and tenths in the tank.

No motorist who watches the cost of running his car can afford to be without a Vacuumeter.

DEALERS: Every one of the 150 makes of cars using vacuum feed represents a field of live prospects for Vacuumeters. Write nearest representative for dealer proposition.



Price

$18.50

VACUUMETER SALES CORPORATION

KNOXVILLE, TENNESSEE

VACUUMETER SELLING CO.
Eastern Distributors
Philadelphia, Penna.

ENGINEERING SALES CO.
Dollar Bank Bldg.
Youngstown, Ohio

THE THOMAS-BRAY CO.
Provident Bank Building.
Cincinnati, Ohio

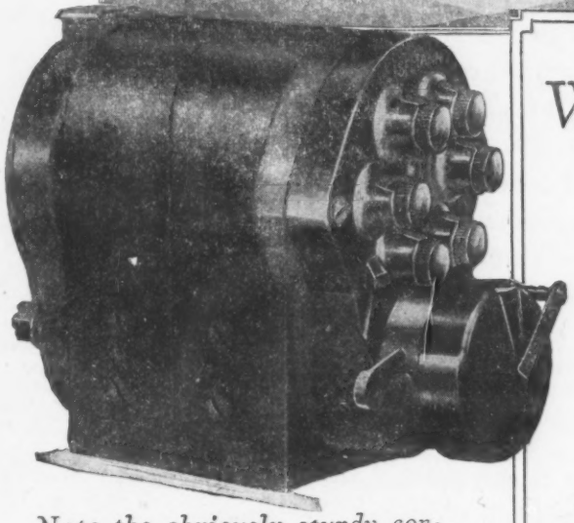
Vacuumeter

"A Gasoline Mileage Meter"

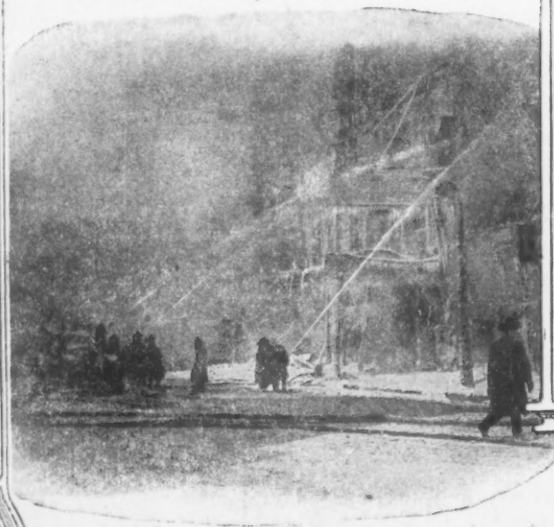
EISEMANN MAGNETO



American LaFrance Fire Engine equipped with Eisemann GN6



Note the obviously sturdy construction and rugged power. The performance of the Eisemann fully bears out this impression.



When the Alarm Sounds

—there must be no hesitation or faltering. A quick getaway is vitally essential!

The Eisemann-equipped Fire Engine responds instantly to the alarm. A powerful, hot, fat, lingering spark is always there when needed.

For dependability under all conditions and in all temperatures, the Eisemann waterproof and dustproof magneto is the last word in perfect ignition!

THE EISEMANN MAGNETO CORPORATION

Makers of Magnetos for All Types of Internal Combustion Engines

Plant and General Offices—32 Thirty-third St., Brooklyn, N.Y.

CHICAGO—910 S. Michigan Avenue

DETROIT—85 Willis Avenue, West

LONDON, ENG. Stanley J. Watson, 37 Sheen Road, Richmond

Call on us at the Chicago and Kansas City Shows

MOORE

THE WORLD'S BIGGEST LITTLE AUTOMOBILE

1920

During the past year dealers have found the Moore a decidedly attractive merchandising proposition. The factors contributing to their success were basic and sound—a good car appealing strongly to a very wide field of prospective owners—performance in the hands of owners exceeding their expectations—and factory co-operation and service of high order.

For 1920, the Moore Selling Franchise will continue to combine an easily saleable car that gives satisfaction backed by a permanent organization whose fundamental policy is "playing square." Car allotments will not be made in excess of reasonably certain production and, depending upon production, those dealers fortunate enough to secure a 1920 selling franchise will benefit by a continuation of the policy of immediate deliveries, which has proved so valuable a sales asset in 1919.

The Moore line for 1920 will include a two passenger roadster in addition to the five passenger touring car. Both models will represent the latest in body design.

Complete Moore Specifications will be mailed to all motor car dealers requesting them on their business letter-heads.

On Display During the Chicago Show at
The Lexington Hotel
2135 MICHIGAN AVE.

MOORE MOTOR VEHICLE COMPANY—*Danville, Illinois*

Masco Vacuum Air Cooler



Puts a Stop to Truck Delays

EVERY day truck delays are costing you lost minutes and money. Little mechanical breakdowns—stops for adjustments—but most time is lost while waiting for overheated motors to cool.

Keeping radiators from boiling—motors cool on any run means capping the radiator of the truck or car with a Masco Vacuum Air Cooler.

It draws cold air into the radiator—sucks out the hot, and condenses the vapor into water for recirculation.

Besides keeping the motor 35° cooler—it warns when water's needed.

Every car—every truck that passes your door is a prospect for the Masco Vacuum Air Cooler. It costs no more than the trinkets owners put on in place of the radiator cap—it looks better and goes on to keep the car running smoother, more efficient; not just as an ornament.

It is attractive looking—substantially made of aluminoid highly nickeled—costs $4.00.

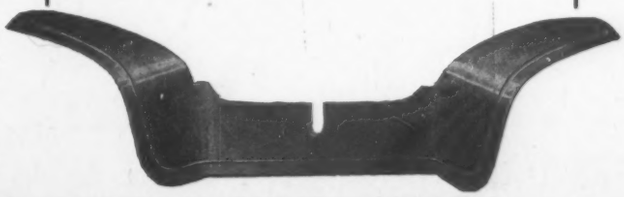
Dealers—Jobbers, write for liberal discounts and details or sales proposition

Mayer Auto Specialty Co.

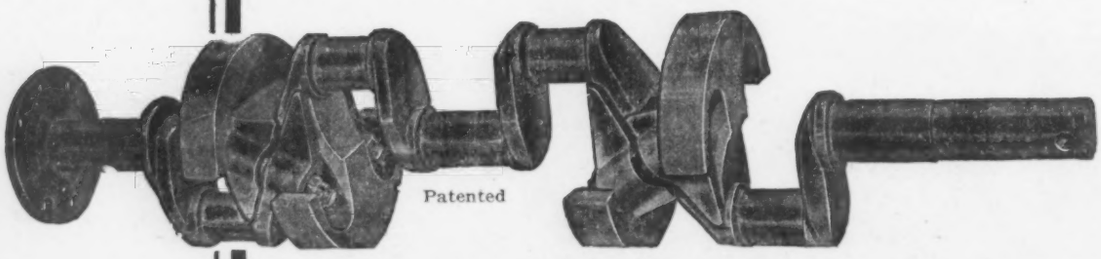
Buffalo New York

The Masco Ideal Splash Fender not only helps to make the Ford look like a higher priced car, but it protects the lights and radiators from the splashing mud and snow—reflects lights ahead instead of under the car and deflects more air into the radiator.

Clamps securely on 1917, 1918, 1919 Ford models—cannot rattle. Easily attached. Dealers—Jobbers, write for sales proposition.



PROFIT MAKERS!



DUNN Counterbalances for Fords

NOW **$8.00**

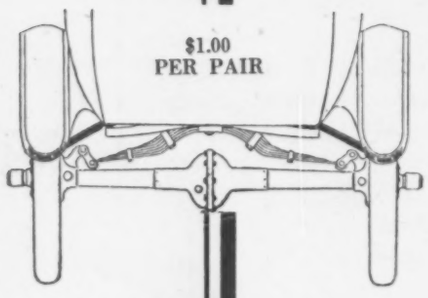
"WORLD FAMOUS" is a coveted term. But this month (January 1920) we have received orders for shipments to Haiti, Peru, India, South Africa, New Zealand, Australia, Hawaii, and England, not to mention Mexico and Canada. Therefore we believe we are justified in saying that DUNN COUNTERBALANCES are "WORLD FAMOUS," being used practically in every country on the face of the globe.

We claim a "Dunn Counterbalanced" Ford Crankshaft is as efficiently and scientifically balanced as any shaft in any motor made.

We back them up with a money back guarantee and our records show more than 99½% of customers satisfied. They save gas and oil and reduce friction and vibration to a minimum, so the cost of $8.00 is not a useless expenditure, but a guaranteed dividend paying investment that will come back to you several times a year one hundred fold, to say nothing of the added pleasure in riding.



(The Dunford Rear Fender Brace Prevents This.)



DUNFORD

Rear Fender Brace for Fords

Take a look at the Fords in your town and note particularly the rear fenders. Notice how they wiggle? And notice how many are cracked and broken? That's because the fenders are supported only at the front ends and the rear ends are left to whip and shake. As a result, the fender soon cracks at the center support and the next act in the drama is a repair bill for a new fender.

The Dunford Rear Fender Brace holds the fender firm and secure. The whipping and vibration is stopped. The fender never cracks. By grasping the tips of the fenders two men can "jump" the rear end of a Ford clear off the ground, a test that would be disastrous were the fenders not properly braced.

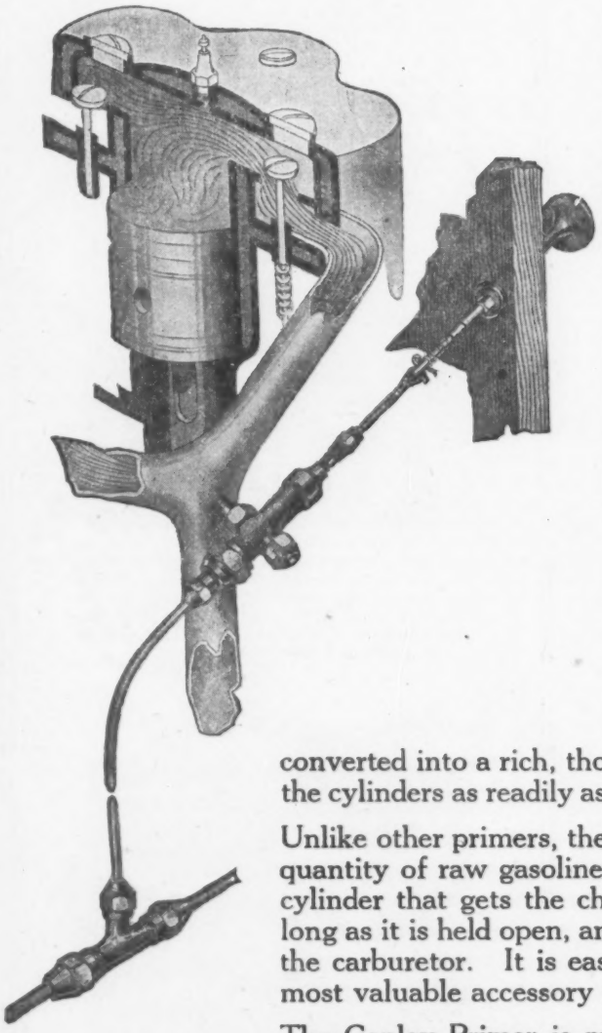
The Dunford Rear Fender Brace gives the fender "a visible means of support." Thousands of dealers have stocked this quick selling accessory. Write for our proposition.

DUNN MANUFACTURING CO.

Motor Dept. A, Clarinda, Iowa

Copley Primer

for Cold Weather Starting



Is now installed as regular equipment on MITCHELL and TEMPLAR cars

Due to the low grade of gasoline now supplied, it is almost impossible to start a motor in a cold garage on a winter morning. The present gasoline simply will not evaporate in cold air and no carburetor supplies sudcient mechanical agitation to vaporize it. Consequently countless storage batteries are hastened to an early death by futile cranking of their motors when the gasoline will not vaporize and fire.

THE COPLEY PRIMER

operates on the same principle as a carburetor. When the motor is turned over, either by hand-crank or starter, the suction of the engine draws a stream of air at high velocity through a small venturi tube where it picks up a quantity of gasoline from a special nozzle. This mixture is converted into a rich, thoroughly atomized gas, which ignites in the cylinders as readily as the mixture in a warm motor.

Unlike other primers, the Copley Primer does not merely inject a small quantity of raw gasoline into the manifold. It not only fires the first cylinder that gets the charge, but is CONTINUOUS IN ACTION as long as it is held open, and will even run the motor without the help of the carburetor. It is easy to install, operates from the dash and is a most valuable accessory the year 'round.

The Copley Primer is mechanically perfect and scientifically correct. We believe that it is the best, quickest and most reliable primer on the market. The price is lower than most others, assuring a ready sale at retail and a bill sale for jobbers.

Dealers and Jobbers—Get your quantity orders in at once. The season is on!

Composed of a "body" casting enclosing a sliding plunger. The plunger has a cross hole, venturi shaped, which registers with the air passage in the body casting when plunger is open. Fastened to the lower end is a gasoline nozzle and telescoping over the nozzle is the plunger which has a fiber seat that rests on the point of the nozzle when the primer is in closed position—shutting off gasoline supply.

Bay State Pump Company

560 East First St. Boston, Mass.

Equip Your Accessory Department With Miller Brothers Cabinets

Miller Brothers Cabinets are an indispensible convenience for all Automobile Accessory Dealers. Our line includes an attractive Bulb and Fuse Cabinet, a nine drawer spark plug cabinet and combined Garage Cabinet.

These cabinets will prove to be silent salesmen in your store. They are neat and attractive and when placed in a conspicuous position will impress customers with the completeness of your stock.

You never have to delay or look around for stock when your accessory department is equipped with Miller Cabinets. Everything is right at your finger tips. Possibility of breakage is reduced to a minimum. You know when your stock needs replenishing, and always have an ample container for a complete supply.

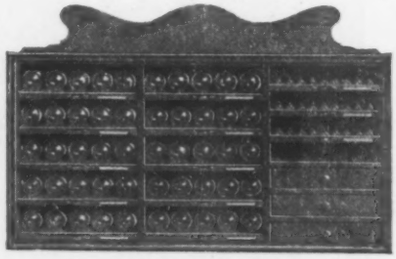
When you are getting your stock in order for the Spring and Summer seasons use Miller Cabinets. They will save time, space and breakage.

Our descriptive catalogue and booklets explain the construction and uses of Miller Cabinets in detail. Write for it today.

MILLER BROTHERS
Lewisburg, Penna.



This Bulb and Fuse Cabinet will hold 200 "G"—12 or "G" 16½ Bulbs. (Sufficient dlepower for all cars in use) 216 Dash and Headlight Bulbs of various voltage and can-Tail Lamp Bulbs provided for in separate compartments. Total Bulb capacity is 416. There are twenty-four separate compartments in drawers for complete line of fuses and ample room for generated brushes in separate catalogued compartments.



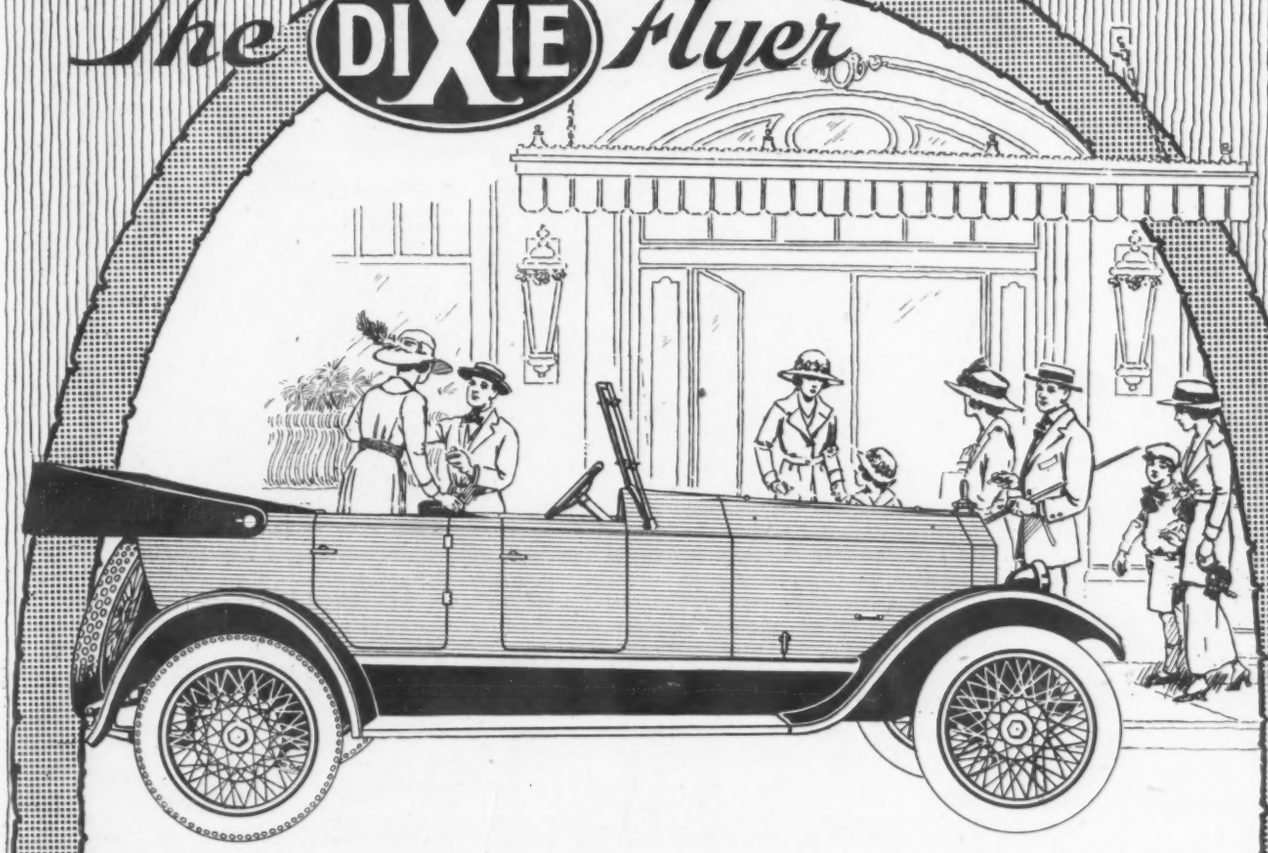
This Spark Plug Cabinet is sectional and may be added to as needed. There are nine drawers, each being equipped with facilities to attach sample plug. The samples will not protrude beyond the container. Its capacity is 400 plugs and porcelains.



This combined Garage Cabinet is a combination of the Bulb and Fuse Cabinet and the spark plug cabinet. When assembled the two cabinets represent a harmonious design. They are substantial, attractive and essential articles of equipment for dealers desiring to give up-to-date, prompt and satisfactory service to their customers.

MILLER BROS. CABINETS

The DIXIE Flyer



Honest

"Honest clean through"—that's the plain-spoken opinion of the Dixie Flyer voiced by an experienced motorist-dealer of the far West.

His judgment was passed after long, hard, trying trips through the rocky, hilly country of Oregon.

Honesty is the keynote of Dixie construction and the foundation of the success that has invariably attended the products of the forty-year-old company that sponsors the car.

With grace, beauty, comfort and luxury the Dixie has been generously endowed. But, primarily, it is the unflagging ability of the car to "take you there and bring you back" and its honesty "clean through" that have won its favor among experienced motorists everywhere.

KENTUCKY WAGON MANUFACTURING CO., INCORPORATED
THIRD AND G STREETS, LOUISVILLE, KY.

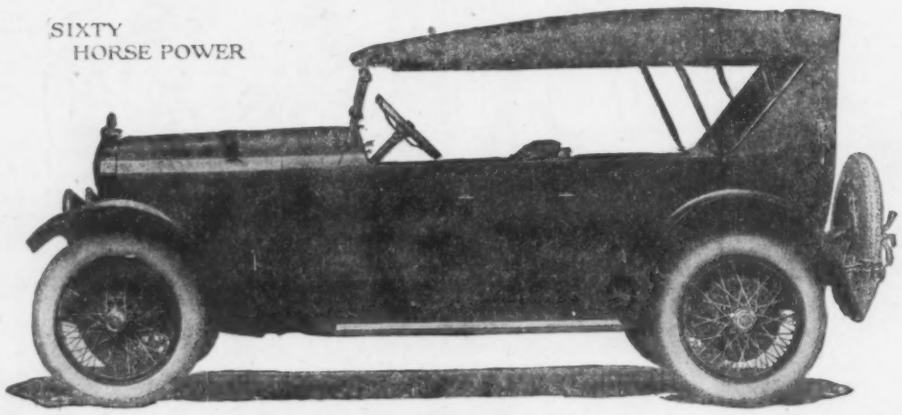
There is still room for more dealers who appreciate the unusual selling possibilities of the Dixie Flyer.

KENTUCKY WAGON MFG. CO. INCORPORATED
DIXIE FLYER
LOUISVILLE, KY.

KING

"The Car of No Regrets"

SIXTY
HORSE POWER



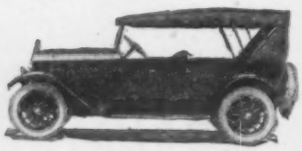
FOURSOME

NEW in one hundred features for greater comfort and efficiency, yet old in reliability, power and stamina.

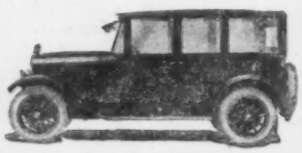
The King of 1920 possesses that high mechanical excellence which can result only from many previous years of multiplied and world-wide operating experience.

The convenience, comfort and beauty of these four models should appeal to the most exacting.

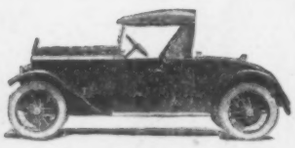
KING MOTOR CAR COMPANY, Detroit



TOURING

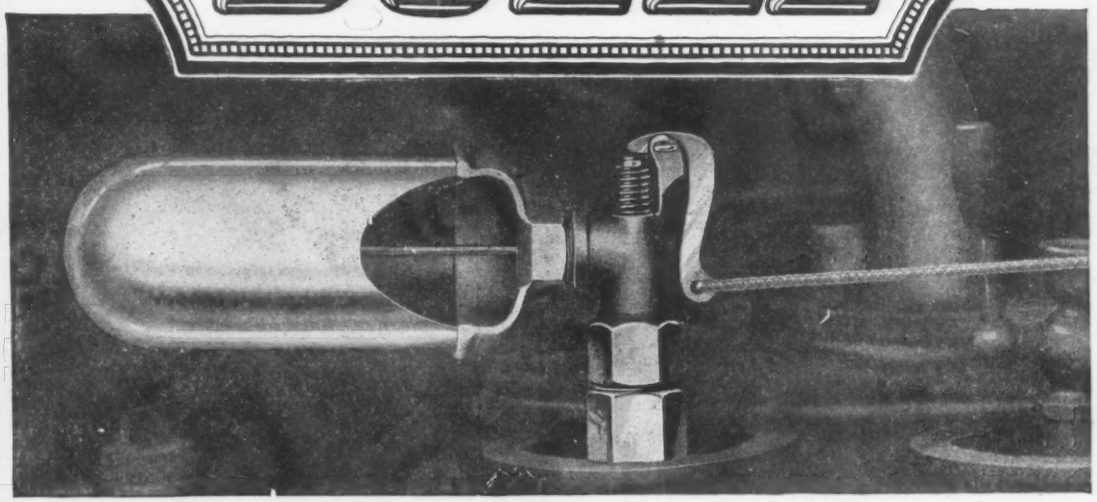


LIMOUDAN



ROAD-KING

BUELL



EXPLOSION WHISTLE

NO longer is the BUELL EXPLOSION WHISTLE considered as just an "automobile warning signal," but more and more each day it is taking its place as an integral part of every well equipped automobile and motor truck.

As such it is recognized by the seventy-five motor car and truck manufacturers who have adopted it as standard or optional equipment. So, also, is the BUELL esteemed by thousands of motor car owners who have equipped their cars with this superior warning device.

BUELL dealers of the past year have remarked on the steadily growing demand for this signal. They have felt the impulse in their stores; have seen the result in their profit column.

The superiority of the BUELL in design—it replaces priming cup and operates with full explosion pressure direct from the engine—its structural strength and simplicity of operation—its record of years of reliable and satisfactory service, and the fact that it needs no adjustment, together with the ten-year guarantee behind each BUELL EXPLOSION WHISTLE, has made this signal absolutely the best for owner to use and dealer to sell.



The BUELL exhibit at the Chicago Show will interest you. Make it a point to call on us. Let us tell you about our big national advertising campaign for 1920 in such magazines as Literary Digest, American Magazine, Motor, etc. We will convince you that it is to your interest to always have a full stock of BUELLS on hand.

And if you can't come to the show, get in touch with your jobber. Ask his opinion of the BUELL EXPLOSION WHISTLE.

BUELL MANUFACTURING CO.

2975-77 Cottage Grove Avenue **Chicago, Illinois**



A FAR REACHING TOOT!-TOOT!-TOOT!-OF REAL WARNING.

The Ford Owners Who Equips L & L One-Piece Transmission Lining Never Goes Back to the Old Three-Piece Form



He will insist on the same lining when his first one wears out. You can get the "Ford owner attitude" in this particular by reading the following extract from a letter written to us by Mr. R. A. Williams of Brooklyn:

* * * "Kindly send me the names of dealers in this metropolitan district that handle your product and if you have none to furnish me, inform me the price of the Lining so that I can buy it direct from you. This Lining has given me a great deal of satisfaction, applying a new set of transmission brake linings.

"Awaiting an early reply so that I can use my car, I remain,

Yours very truly,

There are several millions of Ford owners (your territory has its full quota) who will hold the same opinion after using the L & L One Piece Transmission Lining.

L & L Automobile Accessories Corp.
136 Church St., Hartford, Conn.



Installed in 30 minutes.
No rivets—no felt gaskets.
No chatter — Long Life.

The L & L slips on—just half an hour's easy work. No rivets or felt gaskets are required.

YOU know the three piece lining installation means three hours of hard work.

The "L & L" stops "chatter" by holding the idle drums, gently but firmly, while the working member is "gripped like steel."

The L & L wears longer—causes no trouble and has no record of failure.

The List Price is $3.00—Your sales will grow as the L & L becomes more and more talked about in your territory. Here's quick moving, profitable stock. Get the details.

L & L ONE PIECE $3.00

SLIP ON TRANSMISSION LINING for FORDS

IGNI-TEST

Service Gives Satisfaction That Turns to Profits

Igni-Test in time saved alone will pay for itself in a few days. It will enable you to give better service and more satisfaction to your customers. With it you can locate ignition troubles at once.

Igni-Test is the invention of the Ignition Engineer who designed the Magneto Testing Device adopted by the War Department for the air service and mechanical repair shops. Igni-Test employs all the good points of the original testing device and has many added improvements. It would have been on the market months ago, had we not given our entire output to the Government during the war.

Igni-Test contains no delicate meters or mechanism, nothing to get out of order, does not require an electrical expert to operate it and can be understood by anyone.

With each Igni-Test, we furnish charts and full instructions to make each test and also show internal wiring diagrams of every known make of Automotive Spark Coils and how to test both the windings and the condenser. These charts alone are worth the price of Igni-Test.

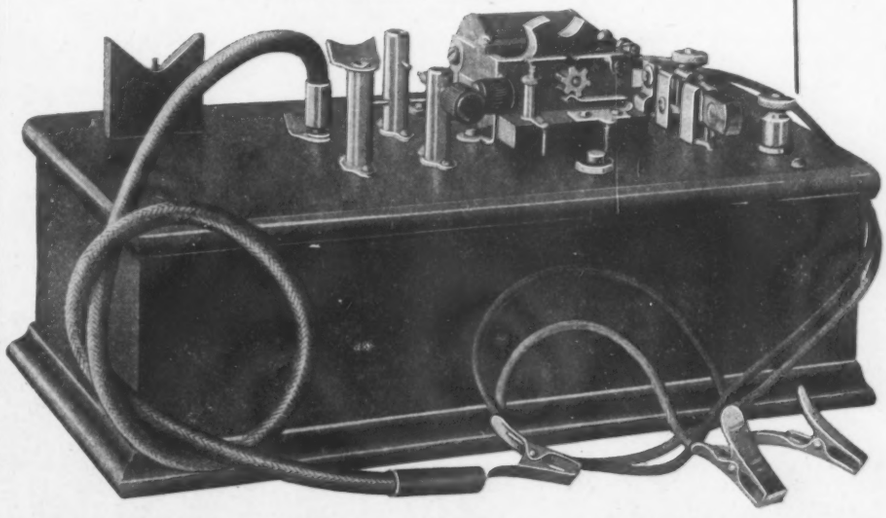
Introductory price of Igni-Test, complete with charts and instructions is thirty-five dollars (for a limited time only), f. o. b. San Antonio. If your jobber can't supply you send your order at once or write for descriptive literature and copies of letters from Igni-Test Users. Jobbers distribution wanted everywhere in the United States.

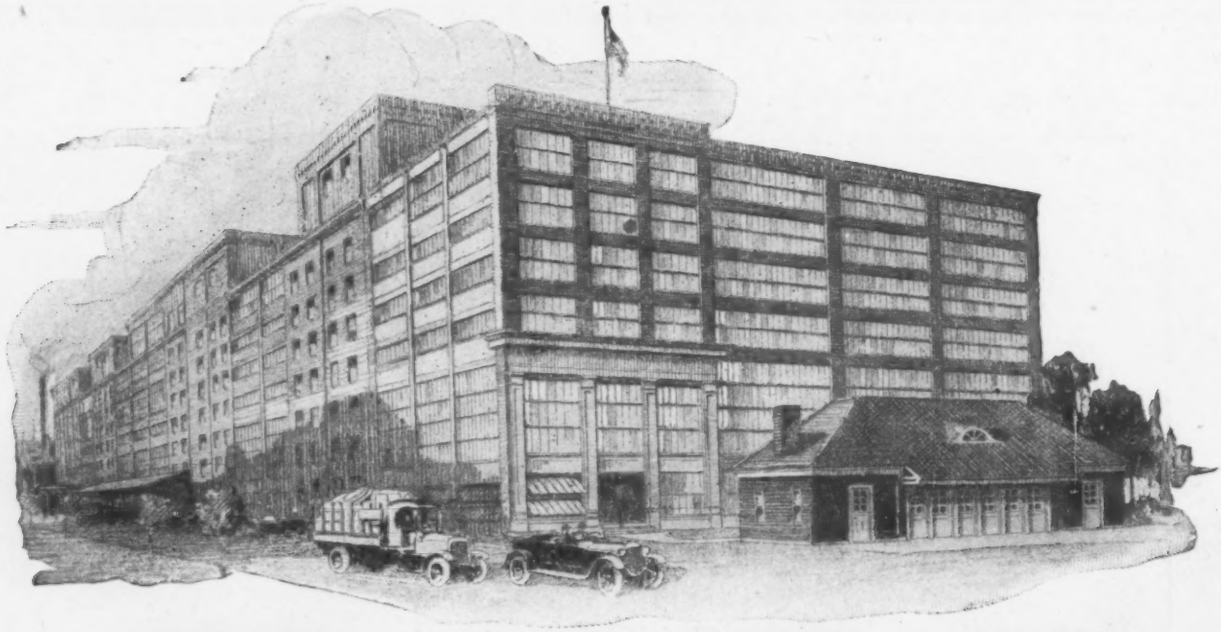
A Few of the Tests That May Be Made with IGNI-TEST

- High Tension Magnetos on Car.
- High Tension Magneto Armatures.
- Two Spark Magneto Armatures.
- Inductor Magnetos.
- High Tension Spark Coils with self-contained Condenser.
- High Tension Spark Coils without Condenser.
- Low Tension Magnetos.
- Low Tension Spark Coils.
- Condensers.
- Condenser Break-down.
- Insulation.
- Spark Plugs.
- Fuses.
- Collector Rings.
- Distributor Plates.
- Brush Holders.
- Grounds in Generators and Motors.
- Grounds or Opens in Line.
- Grounds or Opens in Fields.

Every garage and repair shop should have one or more Igni-Tests. Order from your jobber.

Testall Electric Mfg. Co.
San Antonio, Texas





Plant No 2 Making 3½ inch Tires and Tubes Exclusively

16,000 3½-inch tires and 25,000 tubes per day is the capacity of this new Firestone Factory, Plant No. 2, which is devoted entirely to this one size of tire—3½-inch—the size used by more than half the car owners of the world.

But the kind of 3½-inch tires this factory turns out is of more importance to car owners and dealers than the volume of its production.

All the floor acreage, all the special tire-making machinery, the carefully chosen and organized workers concentrated on this one job, spell one thing—

A better 3½-inch tire.

The service given by this highly perfected special molded tire proves again the ability of Firestone men to build the finest possible on a volume basis.

Firestone Tire Engineers developed this tire to raise even higher the Firestone reputation for quality.

Then Firestone Manufacturing Engineers developed the means of production that would give car owners the added benefit of a low price.

$7,000,000 is the financial investment put into this special tire that car owners might have this quality at such a price.

And when a Firestone dealer shows his customers a cross section sample of one of these tires, the quality can be seen and felt. It is generous in materials. It is a finished piece of workmanship.

Be sure the cars you equip have these better tires and insure your trade most miles per dollar.

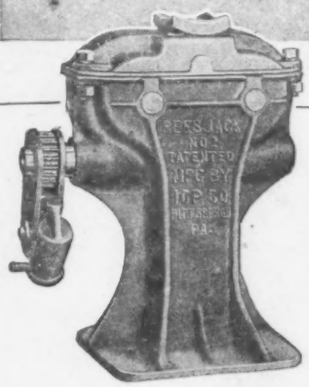
FIRESTONE TIRE & RUBBER COMPANY
Firestone Park Akron, Ohio
Branches and Dealers Everywhere

Firestone



On All Acme Trucks the No. 2 Five-Ton Rees Truck Jack has been adopted as Standard Lifting Tool Equipment.

THE most important Equipment Tool is a Dependable Jack. When You Buy a New Car or Truck, See That a Rees Jack is Provided. It is dependable, p o w e r f u l and convenient.



REES
DOUBLE WORM GEAR DRIVE
JACK

THE makers of the famous Acme Truck early recognized that it was just plain good business to supply a jack that was absolutely dependable. Acme is one of the growing number of prominent truck and passenger car manufacturers who, after conclusive test, have adopted Rees Jacks as standard tool equipment.

The hearty acceptance of Rees Jacks by manufacturers and motorists alike is the unprejudiced reward of merit. It is the recognition of the superior efficiency of the double worm gear drive principle as here adapted for lifting purposes, and indicates that the jack is becoming properly considered individually as the most important equipment tool.

Jobbers—Dealers

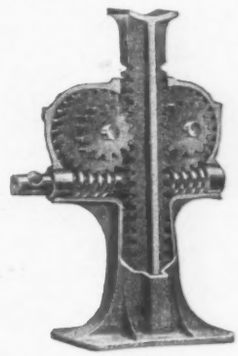
Your customers know about Rees Jacks. Our national advertising is telling them over and over again the story of its safety, power and convenience. There's a good margin of clean profit on the Rees Jack line, and every time a Rees is used it is a demonstration that sells more of them. If your territory is still open, there's a big sales opportunity for you in handling the Rees. Write for our proposition.

Exclusive Manufacturers

Iron City Products Company

Department MA, 7501 Thomas Blvd., Pittsburgh, Pa.

Manufacturers of Rees Double Worm Gear Drive Jacks for Passenger Cars, Trucks, Railway and Industrial Purposes.

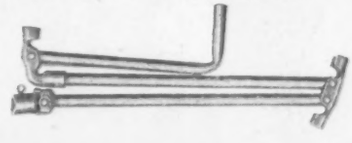


The Rees Passenger Car Jack

This cut-a-way view of the Rees Passenger Car Jack shows the simple design of only four working parts embodied in all Rees Jacks. The double worm gear drive principle as here applied affords great power with an absolute minimum of friction.

This model is conveniently operated from a standing position by its long folding handle. A few easy turns of the handle lifts the heaviest load rapidly to any height. Its convenience and ease of operation is especially appreciated by women motorists.

There's a wonderful market for the Rees Passenger Car Jack alone, and it will lead to the sale of many heavier model Rees Jacks. Retail price $9.00; west of the Rockies $9.50.



Distinction in Tires

VICTOR TIRES give added smartness and riding-comfort to your car. Above all, they give that definite assurance of uninterrupted tire mileage at the minimum of cost per mile that has earned them their expressive trademark—"Mileage Hogs."

For years, all tires made in this time-tested factory by slow, careful, skilled hand-work have gone to appreciative motorists who would ride on none but Victors.

For example, Mr. H. J. Kademacher of the Cream City Casket Company, Milwaukee, Wisconsin, bought Victor Tires for his seven-passenger Kissel-Kar three years ago. He writes: "From these tires I received very close to 18,000 miles, three years of service, and I am more than just pleased with this make of tire. . . . I drive my car all winter and all over the state over all kinds of roads. Have used practically every make of tire, but now I am sure married to Victor. Mileage Hogs is the correct name for Victors for they don't know when they have had enough."

Many records of mileage service prove that the Victor Sulpene Process, with best fabric and cord and pure Ceylon and Para rubber does give a uniformity of high mileage.

Victor production, now greatly increased, brings these tires of supreme quality to you and to all others who seek the lowest tire cost per mile.

Look for a Victor Dealer—he is obligated to give Mileage Satisfaction to you.

The Victor Rubber Company,
SPRINGFIELD, OHIO

Established 1898

FACTORY BRANCHES: Chicago, 1720 S. Michigan Ave. Kansas City, 1707 Grand Ave.—New York, 991 Broadway.

Victor Dealer contracts have the attraction of steady "repeat" orders from satisfied users. Some very desirable territory is available.



Victor
FABRIC AND CORD TIRES

MILEAGE HOGS



TO ADJUST:

Lift jaw, slide to desired size and drop into mesh. Takes only an instant to get any one of nine sizes.

No Knurl Adjustment
No Back Lash

Why Is The Wrench You Need Always at the Bottom of the Tool Box?

Like all of life's mysteries, it cannot be explained. But temper-testing searches for the right-sized wrench can be avoided by slipping a Wizard in your tool box.

his five-in-one wrench is instantly adjustable to any one of ten sizes and not only replaces five ordinary open-end wrenches but is superior to any in sturdiness and balance, besides eliminating back lash which in inherent in all other wrenches.



Length 7¾ in.
Thickness ⅜ in.
Width 2⅛ in.
22½° angle

Patents pending in U. S. and Foreign Countries

No. 29

From the "30 years famous" Wakefield Line of Quality Wrenches.

A Wizard Takes the Place of Five Ordinary Wrenches

Instantly adjustable to ten sizes:

¼ in., 5/16 in., ⅜ in., 7/16 in., ½ in., 9/16 in., 19/32 in., 11/16 in., 25/32 in., ⅞ in.

10 U. S. Standard Sizes.

5 S. A. E. Standard Sizes.

6 U. S. Standard Cap Screw Sizes.

4 Set Screw Sizes.

A WAKEFIELD PRODUCT

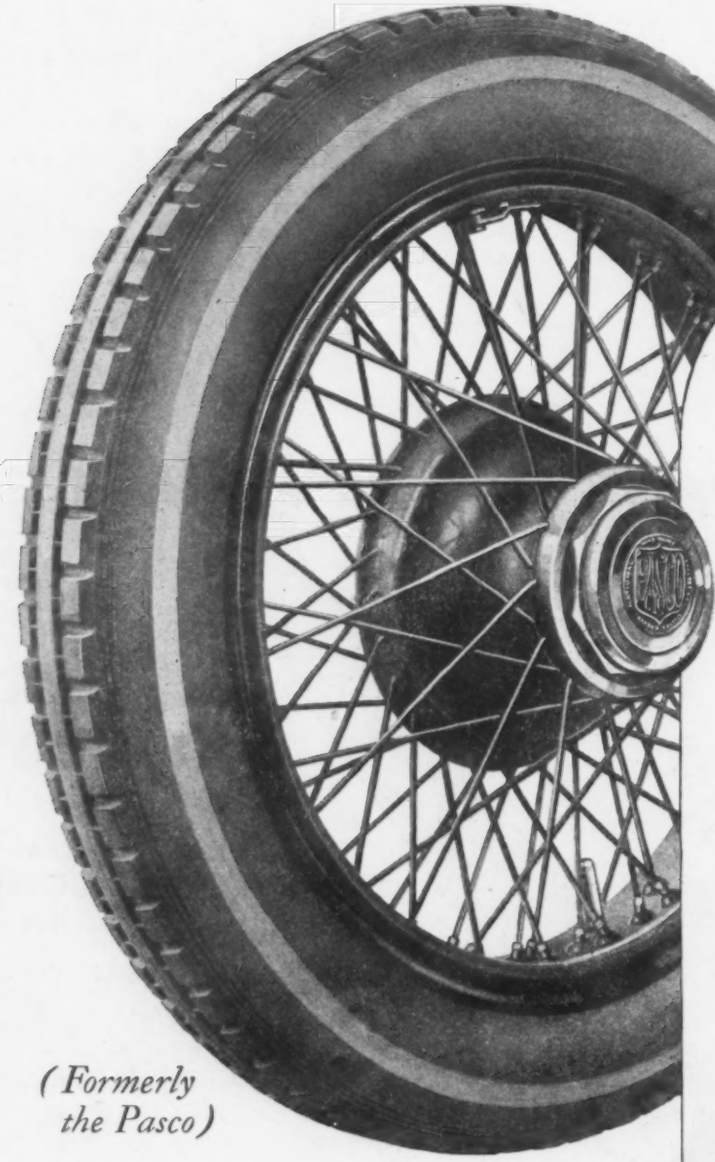
Price $1.50 ea. Each wrench thoroughly greased and packed in individual carton

WAKEFIELD WIZARD WRENCH
ADJUSTABLE OPEN END

Dealers This new Wakefield Wrench—the Wizard—is chock-full of sales possibilities. Every car owner and garage man will buy on sight. Write TODAY for our proposition.

C. E. WAKEFIELD **Sole Manufacturer** **WORCESTER, MASS., U. S. A.**

WRENCH MANUFACTURERS FOR OVER THIRTY YEARS



(Formerly the Pasco)

Some Exclusive Features of National Wire Wheels

By actual test, they are five times stronger than wooden wheels; considerably stronger than other makes of wire wheels. This is due to a special method of spoke lacing.

They are trued and balanced on a special machine—no wobbling with its resultant tire wear; no loosening or breaking of spokes.

Their tread is precisely the same as that of wooden wheels —56 inches.

They are secured to the hub by a two-piece hub cap with double lock nuts, right and left threads; absolutely safe.

They possess greater curb clearance than any other wire wheel; no danger of scraping curb.

Pressed steel hub shells, making for maximum strength and minimum weight.

National

Wire Wheels

A Wheel That Makes Its Own Sales Talk

Set a National Wire Wheel beside any other wheel, and ask one of your customers which looks the best.

In nearly every case he will point to the National Wire Wheel. This statement is based upon investigation, not theory.

Your interest in the matter is obvious: a customer that is half sold at the first glance means a quick sale and a quick profit.

When your customer sees his car equipped with National Wire Wheels —realizes that he has added to its beauty and, consequently, to its value —your quick sale has made a friend for you.

These facts account for the rapid increase in the sale of National Wire Wheels. Car owners everywhere are being sold by their beauty.

In service, National Wire Wheels more than equal their appearance. They are built to serve well and wear well.

Your customers who drive Overland 4's, Chevrolet 490's or Fords will be especially interested in our "Pasco Type" of wire wheel.

Thousands of "Pasco Types" are lending grace to these cars and making ardent friends of their owners.

National Wire Wheels are on exhibit at Chicago Show (Coliseum), Jan. 24 to 31, Space 62-63-64.

Letters from prospective dealers will receive prompt and careful attention. Some very valuable territory is still open.

NATIONAL WIRE WHEEL WORKS, Inc.
General Sales Office: Detroit, Michigan, U. S. A.

Factory—Hagerstown, Md.
Northern Electric Co. Ltd., Montreal, Canada, and Branches

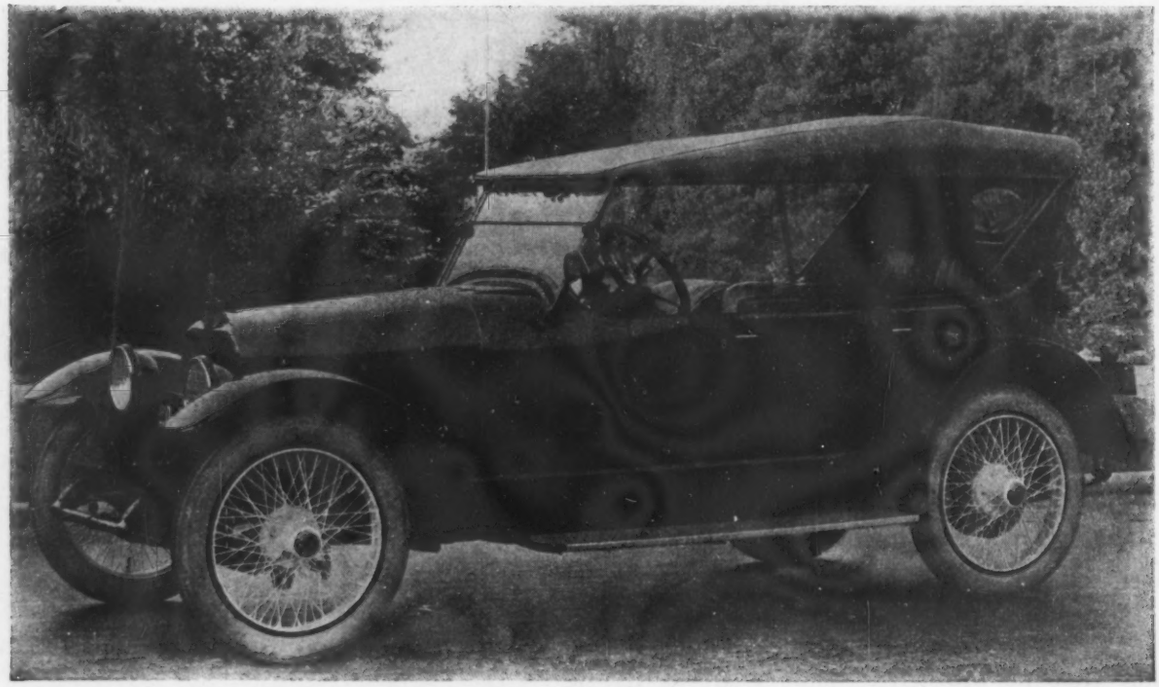
(4)

National

Wire Wheels

Templar

The Superfine Small Car



Templar Top Valve Motor

Five Passenger Touring.....$2685
Two Passenger Touring Roadster..$2685
Four Passenger Sportette.....$2685
Five Passenger Sedan.....$3585
Prices f.o.b. Cleveland

ON DISPLAY SPACE D-2 ARMORY
CHICAGO AUTOMOBILE SHOW

BACK of the Templar car was the conviction that the public wanted a high grade, moderate size motor car.

The car was designed to fulfill this need, and powered by the most phenomenal four-cylinder motor ever produced.

With skillful engineering, the finest materials and careful workmanship, the Templar has enjoyed over two years of unprecedented success—proving the conviction well founded.

Emulation is the height of flattery and numerous are the coming announcements of cars seeking to compete in the field first pioneered by Templar.

The Templar is built as fine as the best, most completely equipped, light, small in size and a wonderful performer.

THE TEMPLAR MOTORS CORPORATION

3100 HALSTEAD STREET, LAKEWOOD, CLEVELAND, O.

The Pioneer Builders of Quality Small Cars

Let This Silent Salesman

Help You Sell PRESTO-FELT Windshield Cleaners

Here is one of the best dealers' sales aids yet devised. It shows clearly and graphically how the one single type of Presto-Felt Windshield Cleaner may be attached to any and all types of windshields. It is a most effective display and demonstration of the Presto-Felt Cleaner and it works all the time, week after week, month after month, helping you sell Presto-Felt Cleaners.

The PRESTO-FELT Display Stand

It shows the Cleaner attached ready for use;—shows exactly how the Cleaner operates on a car. The customer does not have to imagine a single feature,—the Display Stand Shows him—yes, it Sells him a Presto-Felt Cleaner without having to say a word. It does the job by demonstration.

Substantially made of wood, bright mahogany finish, fitted with regular windshield glass with Presto-Felt transfer design in colors at bottom. Is 17 inches high with base 6x10⅝ inches, equipped with rubber pads to prevent scratching.

This Shows How the Presto-Felt Is Attached



1. Clamps Over Top of Frame.
2. Bolts Through the Frame.
3. Bolts Through the Glass.

How to Get This Silent Salesman

Place an order with your Jobber or send direct to us for one dozen Cleaners. Three of these Cleaners will come attached to the Display Stand; while the remaining nine will come in regular cartons. The entire dozen Cleaners will be billed to you less your usual dealer's discount. No charge whatever will be made for the stand itself.

You take no risk whatever for you can always get your money back by merely detaching and selling the three Cleaners that come with the Display Stand.

If you have already stock Presto-Felt Cleaners and wish this stand, write us, giving your Jobber's name and address.

Remember these Ten Important Points

About the PRESTO-FELT Windshield Cleaner

1. The Only Cleaner with Chemically-treated felt Pads (no rubber to rot and wear out).
2. Cleans Both Sides of Glass at Same Time.
3. One cleaning sufficient in any Rain or Snow (unnecessary to operate this Cleaner continually).
4. Leaves both of Driver's hands free to operate car in congested traffic.
5. Prevents "beads" of Rain from forming on Outside of glass.
6. Keeps dust, dirt, steam and frost cleaned from inside of Glass.
7. Can't rattle—Fits Tight—Impossible to work loose and drop down in line of vision.
8. The Only Cleaner designed to fit any position on any windshield of any car with a single type of Cleaner.
9. Dealers need to stock only ONE type of Cleaner which meets ALL requirements.
10. The Cleaner with a Guarantee of Satisfaction—the kind you can recommend to your customers.

List Price $2.00 including all necessary attachments. Write for dealer discount and get the Presto-Felt Silent Salesman shown above.

The Presto-Felt Mfg. Co., 72 Presto Building, Toledo, Ohio, U. S. A.

PEERLESS RADIATOR



NO. 11

This GUARANTEED Radiator is equipped with the indestructible PEERLESS HONEYCOMB Core, that is so efficient for the cooling of Ford engines.

All parts coming in contact with water are of durable brass.

PRACTICALLY FREEZE AND BOIL-PROOF.

Radiator shell finished with two heavy coats of black Japan; also nickel-finish. Brass core in gray. Fits 1917 and later model Ford cars. Also Ford One-Ton Truck.

Increased manufacturing facilities have enabled us to add an exact duplicate of the Ford Fender to our present line. This fender is in demand and will be a big seller. Shipments February 1st.

Ask your jobber about PEERLESS PRODUCTS FOR FORD CARS; radiators, hoods, radiator and hood combinations, fenders, tool boxes—or write Dept. 8 for complete catalogue.

Visit the PEERLESS Display at the Chicago Show—January 24th to 31st. Annex of Coliseum — Spaces 198-99

THE CORCORAN MFG., CO.

CINCINNATI

Breaking the Back of the Sluggish-Fuel Plague

Transforming the Present Low Gravity Fuel Into the Equivalent of Chemically Pure Gasoline, Wizard Banishes the Cause of Starting Difficulties, Power Loss, Gas Waste and Carbon Trouble.

A Result of Exhaustive Laboratory Experiments—A New Chemical Formula that Breaks Up and Utilizes the Heavy, Inert Oil Found In Modern Gasoline. One Wizard Tablet to Each Gallon of Fuel Rouses the Sleepy Gas Into A Virile, Potent Sourse of Explosive Energy. All Carbon Disappears From the Motor. No Fresh Carbon Can Form.

THE problems arising from the scaling down of motor fuel standards have found their solution at last—in a new and startling achievement in chemistry.

Crowded out of the gasoline by the increase in carbon content, the vital explosive agents so necessary to complete combustion can now be restored to their proper and useful sphere.

And these life-giving, power-producing elements compressed into simple, innocent looking tablets that stir the sluggish fuel out of its drowsiness—completely changed, invigorated, revitalized. This is what Wizard has done. Wizard—the product of a new discovery in chemical compounding. Wizard—a forceful, unfailing tonic that brings back memories of 1913, the days of 76 degree gasoline.

Destroys and Prevents Carbon

And no more carbon, with Wizard in tank. For Wizard consumes the carbon in the engine—and Wizard-made gas leaves no residue for fresh formations. Carbon goes and *stays away.* Best of all, Wizard does its work without acids, alkalis or other impurities to attack the metal and harm the engine. It is *safe.*

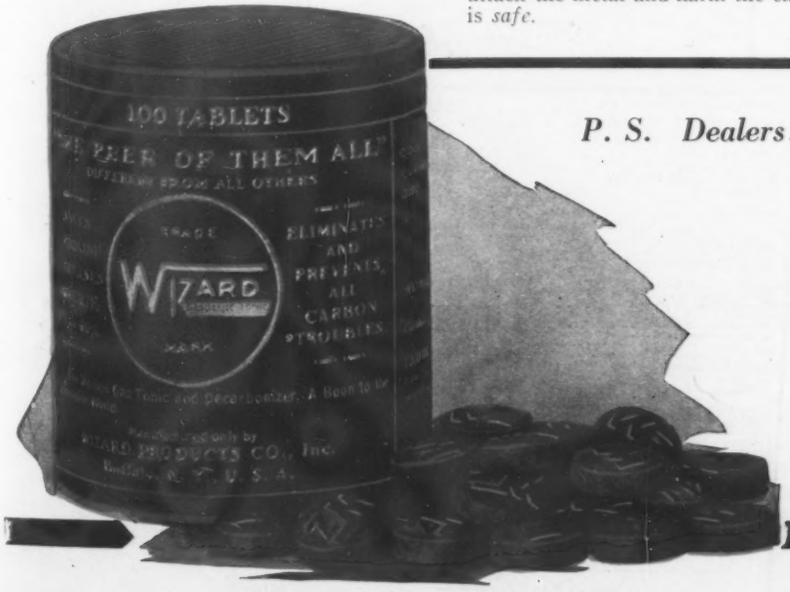
With gasoline today containing 36% kerosene, what wonder that Wizard finds a whole-hearted welcome from a long suffering public!

No Liquid to Measure

One Wizard tablet dropped into the tank for each gallon of gasoline—and all the annoying, costly ills produced by low gravity fuel are banished forever.

Is that guaranteed? It is—unreservedly. Your money back if you ask it.

One dollar buys one hundred tablets—enough for one hundred gallons of gasoline. One penny to make each gallon of fuel deliver the power, speed, starting ease, flexibility and economy of days gone by.



P. S. Dealers: **See the coupon on the last page of this advertisement.**



WIZARD

These Letters the Verdict

LAKESIDE LABORATORIES
Analytical Chemists
CHARLES W. BULLOCK, A. C., PHAR. D., CHEMIST IN CHARGE
91 CALUMET BUILDING
52 W. CHIPPEWA ST.

Jan. 21st 1919.

Wizard Products Co.,
Buffalo, N. Y.

Gentlemen:

The samples of Wizard Tablets given us for analysis have been examined, and found to be free from camphor, alcohol ether, picric acid, mineral acids, which would be injurious to metals.

Sincerely yours,
LAKESIDE LABORATORIES
By: C. W. Bullock

ELCO BAG AND WASTE
LIMITED
65 PEARL STREET
TORONTO, CANADA

Mr. Chas J. McDonald,
Toronto.

November 27, 1919.

Dear Mr. McDonald:-

It was through the recommendation of a friend of ours to whom you had sold some of your "Wizard" tablets, that we had decided to try them out.

Our car, which is a McLaughlin, was full of carbon and would run without knocking, particularly when turning corners. After we had used some of these Wizard tablets, the change was noticeable immediately, and we would not hesitate in recommending them to any of our personal friends.

Very truly yours,

STRUTHERS & SONS
CHEMISTS
BLOOR ST. & PALMERSTON AVE. PHONE COLLEGE 1287
ARTHUR ST. & EUCLID AVE. PHONE COLLEGE 3906

TORONTO, Nov.27.1919.

Mr.C.J.McDonald,
Toronto.

Dear Sir,

I feel it almost a duty to let you know my experience with, and therefore my appreciation of,your "Wizard" Tablets.

As you probably remember,I was quite doubtful of the virtue of the tablets,but a trial has quite convinced me that they are all you claimed.

So far the outstanding feature has been the ease with which the engine starts this cold weather. If the tank is filled and the tablets not added to the gasoline I can always detect it by the starter. So far I have not thoroughly tested them as to increased mileage but I am sure I am not using so much gas as before; further more the engine is not carboning as before.

I now feel that the tablets are an essential addition to gasoline,particularly as sold to-day.

Youre truly,
J. Struthers

P.S. Incidentally, I drive a "Dodge".

THE SHELBY SALESBOOK Co.
FACTORIES: SHELBY AND FREMONT, OHIO.
GENERAL OFFICES
SHELBY, OHIO.

Nov.15,1919.

The Knapp-Coxhead Sales Company,
Associated Service Building,
256-266 Main Street,
Buffalo, N.Y.

Gentlemen:-

As factory representatives for the Wizard Products Company, it will undoubtedly be of interest to you to know of my test with Wizard.

I have now used one-hundred and twenty-five tablets consuming one-hundred and nineteen gallons of gas. Before using Wizard, best mileage obtained from my Oakland Six is ten miles per gallon, and since using Wizard my mileage has increased to nineteen miles per gallon.

The oil consumption has been cut in half, using approximately one quart per one-hundred and fifty miles which seems to me to be very unusual.

The carbon which has always been so prominent in the spark plug has almost entirely vanished, thus not necessitating my cleaning these plugs which was heretofore necessary, should I wish to have perfect ignition.

There is nothing that can, or will take the place, or will do the work of Wizard, and I recomend it most highly to anyone and with such performance your success is assured.

You have my permission to refer any one in doubt regarding Wizard.

Youre very truly,
Wm. S. Smith

WFD-HAM.

THE LEVIS
DEALERS IN
WASTE PAPER AND RAG STOCK.
TORONTO, CANADA.

Nov. 18, 1919.

Mr. C. J. McDonald,
52 Stanley St.,
Toronto.

Dear Sir:

I have exhausted the supply of Wizard Tablets which I purchased from you and they have given me great satisfaction.

I would appreciate your calling in at your very earliest convenience as I wish a further supply of these tablets.

Yours very truly,
Harold Levis

Phone College 4064 476 Bathurst Street

HARRON'S DYE WORKS
DYERS, CLEANERS AND PRESSERS.
FEATHERS CLEANED, DYED AND CURLED.
KID GLOVES CLEANED AND DYED.

Toronto, Nov. 25 ... 191

Mr. C. J. McDonald,
Canadian Distributor,
Wizard Gas Tonic Tablets, Toronto, Ont.

Dear Sir:-

Have found the Wizard Tonic Tablets to be most satisfactory.

I have had one of my cars examined to see if it was clear of carbon, and I am pleased to advise you that there was no carbon to be found, also am informed by the drivers that the cars are very much easier to start, and seem to have much more power.

You can count on me as a continuous user as I have found them to be all that is claimed.

Youre truly,
H. J. Harron

Buffalo, N. Y.
Nov. 24th, 1919.

Mr. M. J. Frank,
% Wizard Products Co., Inc.
Buffalo, N. Y.

Dear Sir:-

During the past two years there has been several oils, tablets etc. put on the market which were claimed to increase gas efficiency, remove carbon and give great mileage.

I have given them all a trial and am of the firm opinion that your tablet does all that is claimed of it or more.

The low grade gas and benzol which is now on the market tends to leave a heavy deposit of carbon and cut the viscosity of the oil due to the fact that it is not properly broken up when vaporized, thereby making the combustion incomplete, which of course is bad for a motor.

I find in my experimenting that I do get more mileage and that the carbon deposit is soft which does not tend to cause pre-ignition also that the oil gives longer service and is in better condition. I am convinced that Wizard does lubricate the walls of the firing chamber so that the pistons do get lubriation on the upstroke.

I take great pleasure in writing you and recommending your product to all my friends, and gladly give you permission to use this letter or my name in any way you wish.

Wishing you the success I feel you are sure to enjoy, I am

Sincerely yours,
Byron K. Waterman
Instr. Motor Mechanics,
U.S.A.

Syracuse, N. Y.
November 11, 1919.

Wizard Products Co. Inc,
802 Pearl Street,
Buffalo, N. Y.

Gentlemen:-

Have been using "Wizard" Gas Tonic and Lecarbonizer Tablets in my Overland-"Model 79" for the past two months and find the results to be all you claim for them. My former mileage per gallon of gas 8 miles, while today 22 miles per gallon is obtained, and I find my motor clean, snappier and possessed of more pep than ever before, being able to take hills on high which my car was never able to take before.

Another point I wish to remark about is the lubrication of the Cylinders. Previous to using the tablets it was necessary to carry excess oil in the engine bore for the splash system. Today I carry only 4 quarts of oil in base and find it only necessary to replenish one pint of oil about every 125 miles running. My method was to decrease the size of oil dips on connecting rods, thus eliminating the throwing of excess oil in base. Finding that the tablets contain the necessary oils for lubricating cylinders and walls on explosion and to furnish lubrication on the up stroke and doing away with all friction, making a smooth running motor.

Sincerely yours,
Harry M. Child

422 Delaware Ave.,
Syracuse, N. Y.

Are Expressive of of All Users of WIZARD

OUR GUARANTEE

We hereby guarantee "WIZARD" GAS TONIC AND DECARBONIZER TO BE FREE FROM ANY ACIDS OR OTHER INGREDIENTS which are in ANY WAY INJURIOUS TO THE MOTOR. That it will remove and prevent carbon from forming inside a motor in which it is used according to our directions; and that it will increase power and mileage and decrease fuel consumption in any motor. If, after you have thoroughly tested "WIZARD" by using up to 25 tablets, you are not perfectly satisfied, return the original package with the unused remaining tablets to us and the purchase price will be promptly refunded to you.

MANUFACTURED BY
WIZARD PRODUCTS CO. Inc.
BUFFALO, N. Y. U. S. A.

Boyle Auto Electric Service
AUTOMOTIVE ELECTRICAL ENGINEERING

Nov. 28, 1919.

Wizard Products Co.,
Buffalo, N. Y.

Attention of Mr. Frank.

Dear Sirs:-

As you undoubtedly know we are handling your WIZARD tablet with great success. The writer was somewhat sceptical of gas tablets in general, but upon the admonishing of friends and requests from some of our customers, we put in a case of your tablets.

It has proven a step in the right direction and we find that it is the best "repeater" we have, and it really does all you claim of it---in fact, some of our customers would not try them on account of their experience with other makes of tablets, but showing them that their money was here waiting for them if the tablets did not do as specified, we soon had it coming them, and we are glad to say that we have had not a single "complaint" or complaint, but our sales have increased from one case every two weeks to an average of six cases per month.

It is the tablet for the skeptic, and we feel that your product is all you claim of it, also we are free to say that your business methods have been above reproach in all our dealings with you.

Yours very truly,
BOYLE AUTO ELECTRIC SERVICE

Strauss-Dilcher Auto Supply Co.
707 Main Street
Buffalo, N. Y.

Mr. H. J. Frank,
c/o Wizard Products Co., Inc.
City.

Gentlemen:-

Beg to advise that we have decided to catalog your catalog your "Wizard" this coming season, and will give your line a full page showing.

Since taking this matter up with our salesmen they all seem very much enthused over this article and it has been increasing their sales.

We also wish to state that when we sell a box of "Wizard" to any of our customers, we have sold the something that we know will bring a duplicate order.

We also have been using "Wizard" in our own delivery cars and salesmen cars, and find a great saving in our gas bills, and also find we have no trouble with Spark plugs, and it is much easier starting cars.

We feel sure that we will double our sales of "Wizard" for the coming season, and trust that very good results will follow.

Very truly yours,
STRAUSS-DILCHER AUTO SUPPLY CO.



ECHO MOTOR CO., Inc.
Cars, Trucks
Sales and Service
Delaware and Young Streets
Tonawanda, N. Y. December 1st, 1919

Mr. H. J. Frank,
c/o Wizard Products Co.,
Buffalo, N. Y.

Dear Sir:-

We have retailed your Wizard Gas Tonic Tablets to our customers for the last several months, and they have given wonderful satisfaction. We have used a great quantity of these tablets, and our sales are getting greater every day. In short they fulfill all your claims, and we can recommend them very highly.

Yours very truly,
Echo Motor Co., Inc.

ANDA TIRE SERVICE
ND TUBE VULCANIZING
O-HAND & RE-MOULDED TIRES & TUBES
Tonawanda, New York.

December 2nd, 19

Mr. H. J. Frank,
c/o Wizard Products Co. Inc.,
Buffalo, N. Y.

Dear Sir:-

Wizard Gasoline Tonic has proven a big seller and a fast repeater for us. We tried it out thoroughly before offering to our trade, and upon placing our first quantity in stock, we made an attractive display and received a great many inquiries for same. We have recommended Wizard and our sales have been steadily increasing, in fact to such an extent, that where we ordered first in dozen lots, we are now ordering by the case, and can highly recommend it to anyone.

Very truly yours,

Arthur H. Suttles



W. BERGMAN HARDWARE CO.
WHOLESALE DEALERS
Hardware, Tools, Auto Supplies
Distributors of OHIO TIRES and TUBES
4600 Genesee Street
BUFFALO, N. Y. 12-3-19

Mr. H.J. Frank,
c/o Wizard Products Co., Inc.
Buffalo, N.Y.

Dear Sirs:-

We at first hesitated to stock Wizard One Tonic Tablets, being very skeptical as to its merits, owing to previous unsuccessful products of like nature. Since handling Wizard we have found an increasing demand and have placed our orders repeatedly which we find very profitable in returns.

Yours truly,
W. BERGMAN HDW. CO.
BY

SIG:AR

...ate Auto-Supply Co., Inc.
SUPPLIES
...D AUTOMOBILE ACCESSORIES
...RAL OFFICES, 894 MAIN STREET
BUFFALO, N.Y. Dec. 4, 1919.

...J. Frank,
c/o Wizard Products Co.,
Buffalo, New York.

Dear Sir:

We thought perhaps you would be interested to know something about our success with Wizard Gas Tonic.

We have been handling this article for about six months and our sales have shown a steady increase. It was interesting to note that nearly every package we sell to a new customer means repeat orders. We have never handled an article which the users seemed more enthusiastic about.

We can assure you that we are getting behind Wizard with our best efforts, as we believe it is a money maker which makes satisfied customers.

Wishing you the best success, we are

Yours truly,
INTERSTATE AUTO SUPPLY CO. INC.,
Roy T. Ford
PRES.



WALBRIDGE
BUFFALO

Mr. H. J. Frank,
% Wizard Products Co.

Nov. 26,

Dear Sir:

After considerable voluminous correspondence we stocked WIZARD GASOLINE TONIC. However, we were still skeptical as to the merits of this article, owing to our previous experiences with articles of similar nature. But are pleased to state that we have since ordered repeatedly, and in larger quantities, owing to the ever increasing demand for this product.

We find the WIZARD GAS TONIC TABLET has a very ready market and consider it a good profit maker, and an ever increasing demand from the trade.

Very truly yours,
WALBRIDGE & CO.



JOS. SAUERHOFF CO.
SUPPLIES
FOR AUTOMOBILES, MOTORCYCLES AND BICYCLES
BUFFALO, N.Y.

December 4, 1919

Mr. H. J. Frank,
% Wizard Products Co. Inc.,
Buffalo, N. Y.,

Dear Sirs:-

In answer to your inquiry regarding our experience with Wizard Gas Tablets, we are pleased to report that our sales on them have exceeded our expectations.

As is usually the case with all products of this kind, we were very skeptical at first on the sale of same but due to the repeated sales from each one by our customers and subsequent requests for analysis that were made for us of our product, we were sincerely convinced that this article would sell.

We can safely recommend it to any jobber or dealer and contemplate putting them in stock and look for increased business as time goes on.

Yours very truly,
JOS. SAUERHOFF CO.

Wizard Sales Helps Make Sales



Send this coupon today for your trial order of Wizard and the Dealer Helps.

They mean quick sales, quick turnovers, new friends, constantly enlarging "repeats."

Wizard Products Co., 202 Pearl St., Buffalo, N. Y.

Please send me, C. O. D., Trial Sample Order of Wizard Gasoline Tonic—One Dozen Boxes, with beautiful easel counter display in six colors and literature and sign enclosed.

Name .....

Address .....

City .....

State .....

Jobber's Name .....



Wizard Products Co., 202 Pearl Street, Buffalo, N. Y.

REPRESENTATIVES

G. W. K. Voigt, 404 Finance Bldg., Philadelphia, Pa.—New England, Central New York, Eastern Pennsylvania, Delaware, Maryland, Virginia, Dist. Col. Knapp-Coxhead Sales Co., 256-68 Main St., Buffalo, N. Y.—Western New York, Canada (Quebec and Ontario): Charles J. McDonald, 52 Shanley St., Toronto, Ont.—Automobile Specialties Co., 1524 Masonic Temple, Chicago, Ill.: Illinois., Indiana, Michigan, Western Ohio.—Automotive Equipment Sales Co., 1104 Hartje Bldg., Pittsburgh, Pa.: Western Pennsylvania, Eastern Ohio and West Virginia.

Williams Soft-Pedal

Will Sell Readily to Your Customers Because It Doubles the Pleasure of Motoring

Feeds as steady as the hand throttle—Saves gas and saves bearings.

Holds the foot firmly in a natural position
—Prevents the shoe from being skuffed
—Avoids cramped and aching muscles

Places a non-heat conductor between the shoe and the heated accelerator—keeps the foot cool and comfortable on hot summer day drives.

Prevents the foot from being jarred off the accelerator and keeps the heel from wearing unsightly holes in the carpet or floor boards.

Cost less than a motor meter—less than a spot light—less than a bumper—less than a lock, but adds more to the pleasure of motoring than all these combined.

Dealers:—Write us for additional information and details of our proposition.

WILLIAM SOFT PEDAL CO.
CEDAR RAPIDS, IOWA
E. KULLBERGER, Los Angeles, Cal.
Distributor for the State of California.

What Senator Friedman of Nevada Thinks of the Soft Pedal.



L. A. FRIEDMAN
Goldfield, Nevada

November 25th, 1919.

Mr. A. A. Williams, Pres.
Williams Soft Pedal Co.,
Chamber of Commerce Bldg.,
Cedar Rapids, Iowa.

Dear Mr. Williams:-

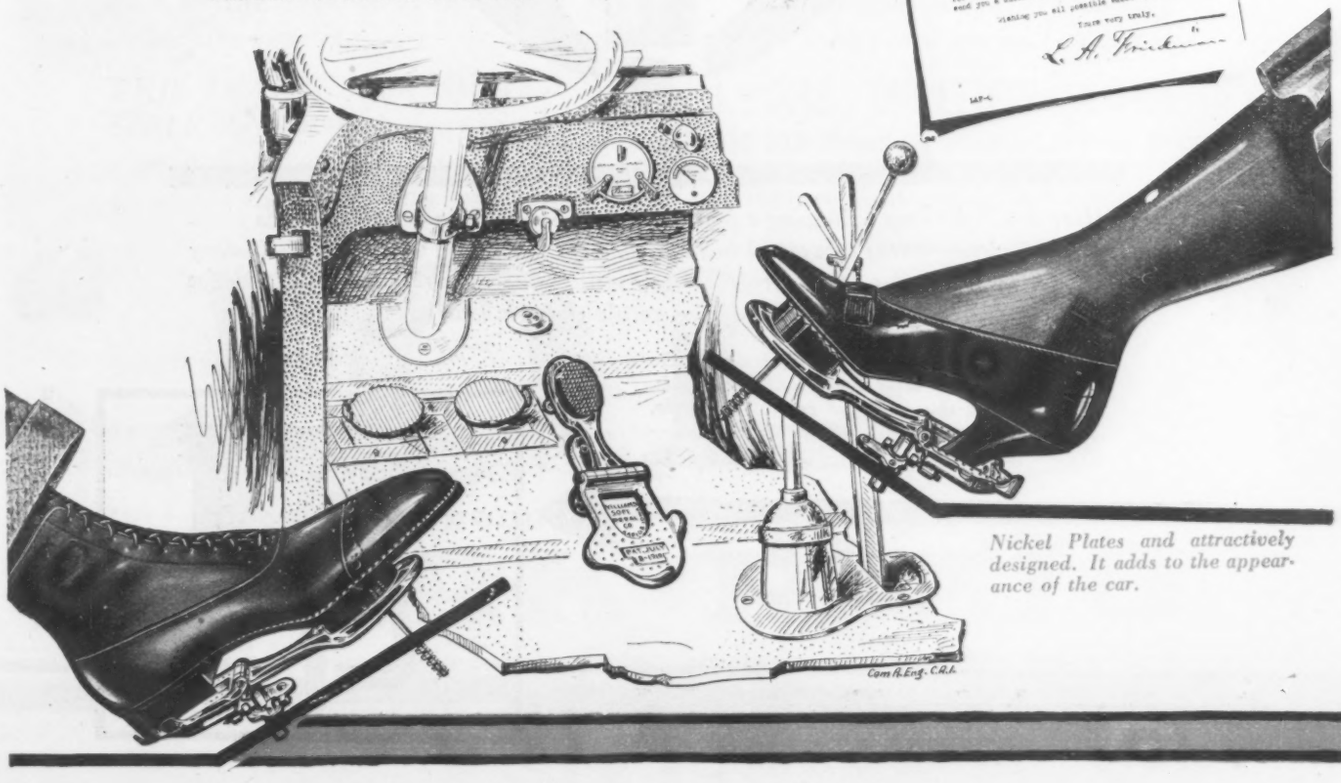
Mrs. Friedman is still using the soft pedal in her Dodge and it is certainly the best accessory I ever saw to an automobile, and there is nothing about the car that we would not rather give than that pedal, and as soon as your concern gets manufacturing these pedals, I wish you would see that a half a dozen of them are shipped to me at once, as I want one for the rackers, the Dodge, and will also use them on our trucks. No please do not count them made, and I believe it would be a very easy matter to sell several hundred of them right around here if you were to do so, as practically everyone who has seen the one in use, friedman's for instance who has seen where they could get one like it, has wanted to know where they could get one like it.

When shipping these pedals to me, send me a bill for wholesale price they are being put out at, and I will send you a check for the amount.

Wishing you all possible success, I am,

Yours very truly,

L. A. Friedman



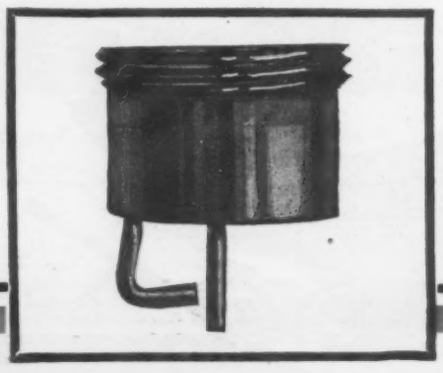
Nickel Plates and attractively designed. It adds to the appearance of the car.

Millions Have Stood The Test---



Here is a "close up" showing a feature of Joly Spark Plug design that has given it an efficiency status away and beyond that ever achieved in the whole history of plug development. The integral heavy milled fingers at the base of the jacket prevent pre-ignition by reason of the ample radiating surface.

A comparison of the above design with the formal slender alloy poles will prove this. These, with the oversized central electrode, cause an even spread, circular mass spark—not a blaze.



All Endurance Records Broken

For Service, Satisfaction and Profit You Dealers Can Safely Stock "Joly" and So Create Exclusive Demand for These Plugs of Right Design and Perfect Performance

HOW MANY MAKES OF SPARK PLUGS do you carry in stock to meet different replacement" demand? More than you want to, perhaps—and more than you ought to, of that we assure you. ONE that will guarantee 100% "return demand" will save you trouble, and annoyance, make, hold and build trade and prove an all-around source of satisfaction to you and your customers.

The .Joly ..Spark .Plug Line is that ONE LINE

JOLY HOLDS THE WORD'S ENDURANCE RECORDS. Over 5,000,000 of them fired *all* of the allied combat planes to victory—and gave a four years' continuous performance in this branch of the service. *Four years of super-service rendered.*

THIS FEAT WAS MADE POSSIBLE because the plugs were designed right, and built according to ideals that stood for only the best in materials and workmanship. Result—no pre-ignition, no carbon collection, no lost compression, no short circuit.

SEVENTY TO EIGHTY HOURS — their life on the engines of the war 'planes. There they stood firm under terrific sustained heat, high compression and no rest while in the air. What does such a plug give to a car, truck, or tractor owner? There is but one answer—*endurance minus trouble.*

AN AGENCY FRANCHISE for the Joly Spark Plug will lead to quick development of your spark plug business. You can stock and sell "Jolly" to your own growing profit and to the everlasting satisfaction of your trade.

The proposition is irresistible— Write and we will prove it

LYONS IGNITION COMPANY

215-219 Fourth Avenue New York City

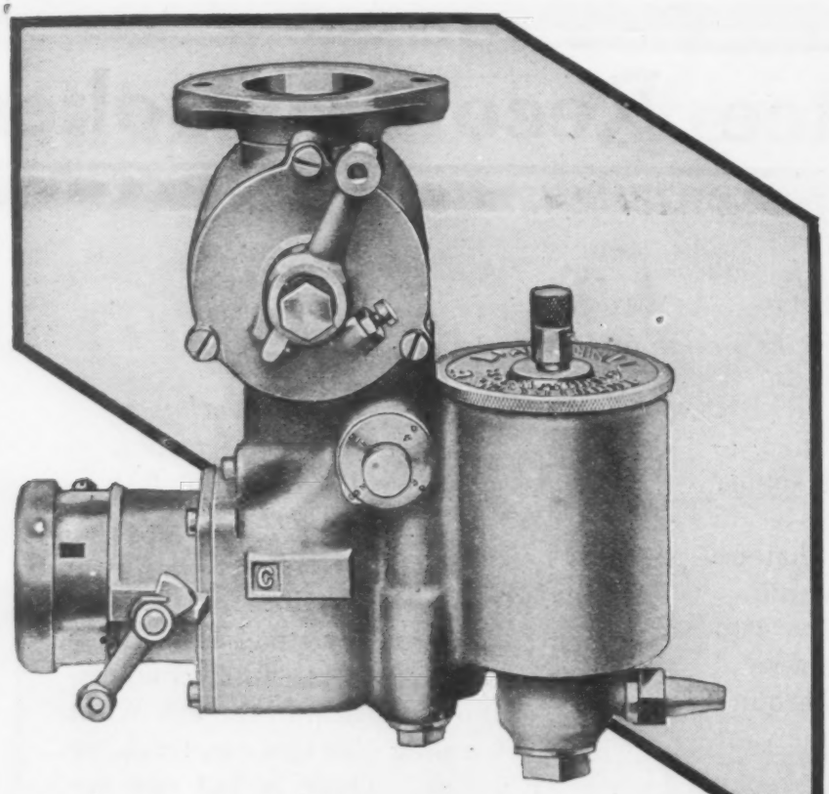
SEE JOLY AT THE SHOW

CHICAGO—Spaces 87 and 88, Coliseum Basement

"JOLY"

(PRONOUNCED "JO—LEE")

SPARK PLUG



See Lacharnay at the Show

CHICAGO—Space 87 and 88, Coliseum Basement.

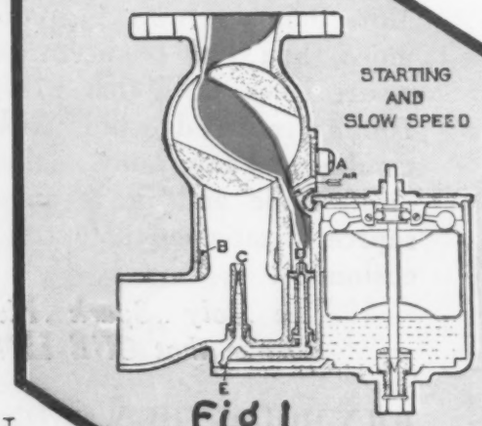


Fig. 1

LACHARNAY HAS EVOLVED THE TRUE PRINCIPLE OF CARBURETION

The thing Lacharnay has done—the goal all carburetor engineers have for years been trying to reach—is to make valve operation *independent of the motor.*

This discovery has resulted in the complete solution of a vexing problem of carburetion: obtaining the proper mixture for all engine speeds, without subjection to the whims and caprices of motor suction—without "butterflies," without sensitive valve mechanism, without delicate adjustments. Here an extraordinary achievement has been recorded—the development of the *full horsepower* of a gasoline motor! *Lacharnay made it possible.* You have never known such flexibility, speed, power—and such startling fuel economy—as Lacharnay will give you. The proof is convincing and conclusive: engineering testimony that banishes all argument.

How the Lacharnay Carburetor Develops Full Motor Horse-Power by a New Means of Absolute Throttle Control

Fig. 1: Shows how in starting and at slow speeds only the jet of small calibre D is working. The necessary rich mixture for idling is easily obtained through a small air intake, which is regulated by turning the knurled ring A, which carries openings of different diameters.

Fig. 2: Shows how by turning the throttle further, for getting medium speed, the air choke B is uncovered, throwing the larger jet C into operation together with the small jet D. But the delivery of the small jet gradually and automatically decreases in the same proportion as the delivery from the large jet increases, because the supply for both jets is controlled by the same calibrated opening E. In other words the delivery of one jet is proportional to the delivery of the other according to the opening or closing of the throttle.

Fig. 3: The throttle is fully opened for high speeds. The small jet D is shut off entirely and the gas is fed only through the large jet C. An excess of gasoline is impossible, first because of the resistance to the flow in the calibrated opening E and secondly by the vacuum produced in jet D. Because of this vacuum, air is forced down jet D and instead of liquid gasoline, jet C delivers a mixture of air and gasoline in the proper proportions. There are two advantages to this combination; first, the impossibility of jet D being stopped by an obstruction; second, the absence of liquid gasoline in the cylinders prevents the abnormal heating and sooting-up of the motor.

Lacharnay Carburetor

Lacharnay's Invention has Resulted in a New Conception of Carburetor Efficiency. Europe's Verdict.

The Lacharnay made its debut in Europe. And achieved notable success. Faced with bitter competition from all parts of the world, it won its way on sheer performance to a position of pre-eminence in the opinion of leading automotive engineers. The famous French Peugeot car has adopted Lacharnay as standard equipment. In Italy, the makers of the Fiat car have now engaged in the manufacture of Larcharnay Carburetors!

This wonderful instrument, fresh from a triumphant showing in our experimental works at Paterson, is now available for the trade. Jobbers and dealers have at last an opportunity to sell a carburetor that will really develop the full horse-power of a gasoline motor. The evidence we have accumulated leaves no room for dispute. We say, with physical proof to back the assertion, that the Lacharnay Carburetor stands head and shoulders above any other instrument that has ever been produced. It knows no competition. **We are going to make this clear to every jobber and dealer in the United States.** The cold facts and figures, without embellishment, will open your eyes to the first real money-bringing value in carburetion devices. Write and ask about them. Full details regarding prices, discounts and other particulars will be forwarded.

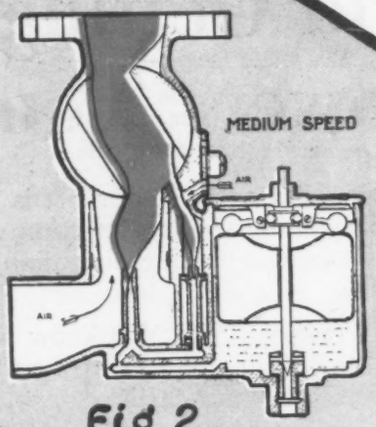


Fig.2

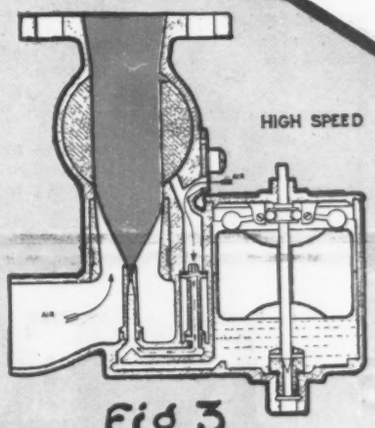
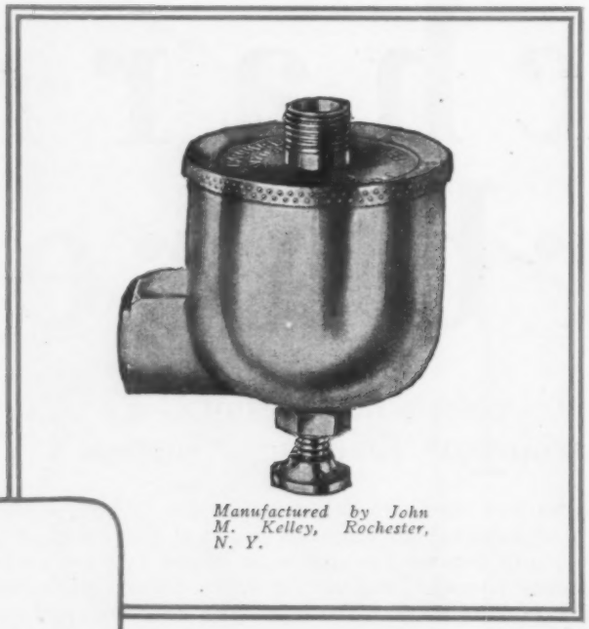


Fig.3

Lacharnay Carburetor
215-219 Fourth Ave., New York
Factories, Paterson, N. J., & Lyons, France

Lacharnay Distributors

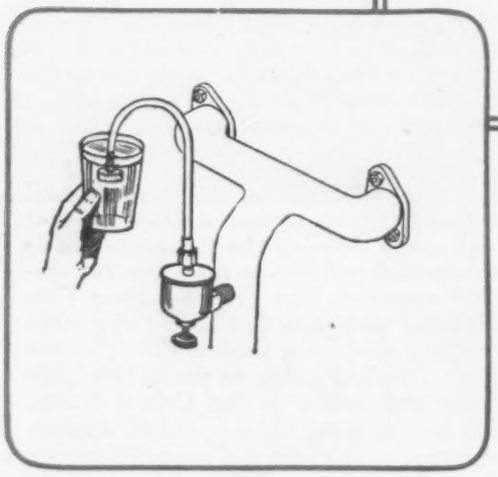
J. H. McCULLOUGH & Son—Philadelphia
GEORGE W. NOCK—Philadelphia
STUART-HOWLAND COMPANY—Boston
GEORGE WORTHINGTON—Cleveland
STANDART BROS.—Detroit
R. HANISCH & SONS—Chicago
GELLER, WARD & HASNER—St. Louis
E. S. COWIE ELECTRIC COMPANY—Kansas City



Manufactured by John M. Kelley, Rochester, N. Y.

What It Means to Save 3 to 6 Miles Per Gallon

Suppose your tank is of 12 gallons capacity and you get 14 miles to the gallon. You can travel a maximum of 75 miles farther before buying more gas. Do you realize you now lose 2½ to 5 gallons out of every tankful you use?



Making Six Gallons of Gasoline Out of Five—and Getting More Power, Too

GUARANTEE

The Universal Re-Carburetor and Primer is guaranteed to outwear any Car and to be free from any imperfections in workmanship or material FOR ALL TIME. If the Re-Carburetor is correctly attached to the engine and properly adjusted, we guarantee that it will work satisfactorily and produce results. If, after having given the Re-Carburetor a good honest test for 30 days, you find you are not fully satisfied with it, we will gladly refund the purchase price.

RE-CARBURETION is what every motor needs for its fuel supply nowadays. Improved carburetion will mean more power and more miles out of each gallon of fuel.

Let's take a look at the fuel proposition. You know how your motor chokes and forces you to change gears on the hills. That's faulty fuel feeding by your carburetor.

The Re-Carburetor, which is universal in application to all cars and automatic in application to all speeds of the motor, re-feeds your motor.

There is no thought or action on your part. When the motor needs lean gas, the Re-Carburetor makes it lean. When it needs rich gas, the Re-Carburetor makes it rich. It's in this re-mixing of gas and air that you reclaim waste miles. Where you used to get 14 miles to the gallon, you can get 16 or 18 with the Re-Carburetor.

UNIVERSAL AUTOMATIC

RE--CARB

FOR PASSENGER CARS,

Cleaning the Motor of Carbon

This same Re-Carburetor, which is a small aluminum valve that attaches to the intake manifold, will clean your motor of carbon. When the motor's hot let it suck in water through the Re-Carburetor intake, using a squirt can.

The water becomes steam and the steam consumes the carbon. Your motor, the pistons, rings and cylinder head will be perfectly clean if water is applied once a week in this manner.

For your convenience, if you desire, the Oxy-generator has been made to facilitate giving the motor a "drink." The Oxy-generator fits over the Re-Carburetor intake and you can apply water with a glass. The Oxy-Generator sells at $1.00.

A Real Cold Weather Starter

A few drops of ether and gasoline or high-test gasoline alone put in the Re-Carburetor will make your motor fire on the first turn-over.

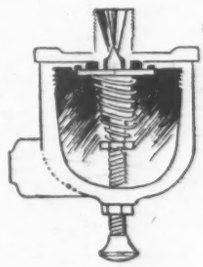
It's easy to install the Re-Carburetor. Just tap the intake manifold. On cars with a vacuum fitting and insert a tee, and sometimes a nipple. If vacuum air line is connected only to one side of manifold, it is best to drill.

The Re-Carburetor is the 1920 big opportunity for dealers. Everyone of our dealers is backed by our guarantee. We are behind our dealers in every way. There is a good profit in this line.

Wire us today for territory you want. Will give you information and discounts at once.

THOMAS ARMSTRONG COMPANY, Inc.

1777-79 Broadway New York City



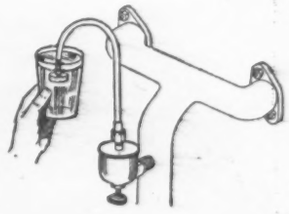
The Re-Carbureter Flutter Valve

—"is a small aluminum valve that attaches to the intake manifold."



Priming or Feeding Water

"When the motor's hot let it suck in water through the re-carbureter intake, using a squirt can."



The Oxy-Generator In Use

"—The Oxy-Generator has been made to facilitate giving the motor a drink."

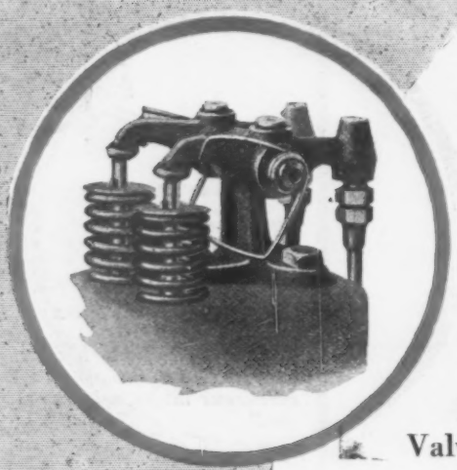
BURETOR and PRIMER

MOTOR TRUCKS & TRACTORS

KF

PRODUCTS Mean

K H K Valve in Head MOTOR SILENCERS



K H K
Valve Silencer

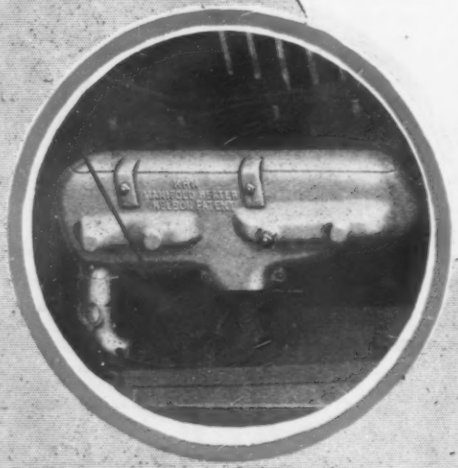
Stop That Noise You can absolutely guarantee to your customers that this attachment will eliminate from 75% to 90% of that annoying clacking noise caused by the action of push-rods and rocker-arms in Buick, Chevrolet, Oakland, Oldsmobile and Scripps-Booth valve-in-head motors.

Thousands of sets of K H K Motor Silencers have been sold in all parts of the United States and Canada. They are highly endorsed by car owners, dealers and automotive engineers.

They stop that clacking noise and add pep to the motor operation.

Your jobber knows about K H K Motor Silencers. Ask him—or write direct for literature and trade discount.

(Patent Pending)



K H K
Manifold
Heater

K H K Manifold Heater

A real Winter sales builder. Fits over the regular Ford manifold. Keeps out cold air and holds heat from exhaust around gas intake, preheating the gas so that every particle is vaporized and exploded regardless of its quality. Saves from 15% to 30% of gas and increases power to a remarkable degree.

Can be attached or detached in 15 minutes by anyone to suit weather conditions. Nicely finished and packed in individual cartons.

It's not too late to stock K H K Manifold Heaters now—there's plenty of cold weather yet to come. Cash in now on this profitable sales opportunity.

(Patented)

KAY H.

967 Woodward

KHK

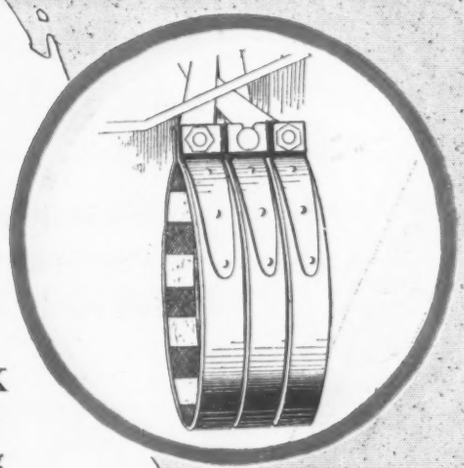
to Jobbers & Dealers

K H K Kork In-Laid BRAKE LINING

Stop That Chatter K H K Kork Inlaid Brake Lining is the 100% brake lining. It eliminates that shaking and chattering in starting and stopping a Ford. It insures a sure, safe, absolutely smooth stop on the steepest hill and in the busiest traffic. Guaranteed to give perfect service for 7500 miles—outwears several sets of ordinary lining. Impregnated with compound that makes K H K Brake Lining proof against oil, grease, water, mildew, etc. Guaranteed not to char or glaze.

Don't confuse this product with other inferior so-called "cork" brake linings. K H K stands for best quality, durability—and moderate price. Send for details.

(Patent Pending)



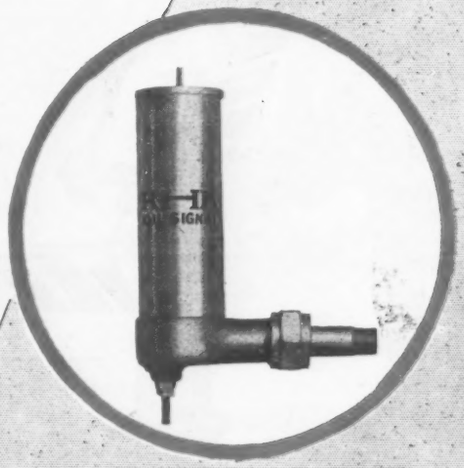
K H K Brake Lining

K H K OIL SIGNAL

Stop for Oil! This novel and practical attachment appeals to every car owner. It blows the horn when the oil in the crankcase or oil reservoir reaches a predetermined danger point. It absolutely removes the possibility of burned out bearings, pistons, and cylinders—through lack of oil. It is the watchdog of the oil supply—always alert, ready to give warning of approaching costly damage. This attachment is destined to be the sensation of 1920 in the accessory line. It will be backed by a strong publicity campaign.

Write for details of this new K H K product and of our sales plan. This is sure to be a big seller.

(Patented)



K H K Oil Signal

KAY CO.

Ave., DETROIT

Manufacturers of high grade automobile accessories that make driving more pleasant and safer—that save gas and increase power. There are more products coming. Get started now and grow with us.

CARSWELL-HAMMOND GARAGE EQUIPMENT

O. K. Tried in the Highest Court and Found RIGHT

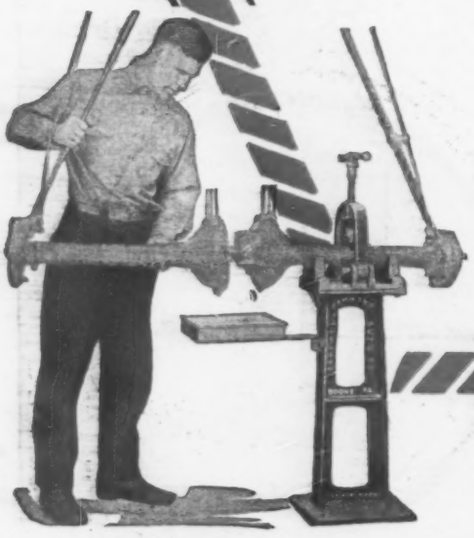
Carswell-Hammond Garage Equipment for work on Ford cars has been Investigated, Approved and Recommended by the Service Department of the Ford Motor Company.

Can we offer better proof of Efficiency, Economy, Durability and all that stands for Quality?

Success in the garage and repair business is largely dependent upon equipment that insures correctness of workmanship and perfect results economically attained.

Let the Carswell-Hammond Garage Equipment insure such results.

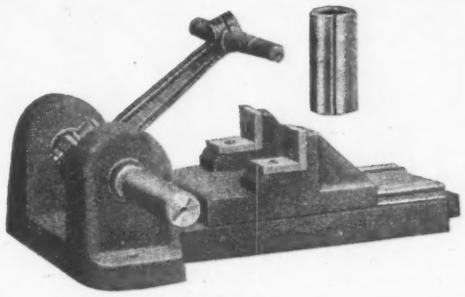
It opens the road to satisfied customers, Profitable Business and Growing Trade.





Piston Vise With Adjustable Set for All Motors.

"Do More Work in Less Time"



More Repair Profits

By Modern Methods

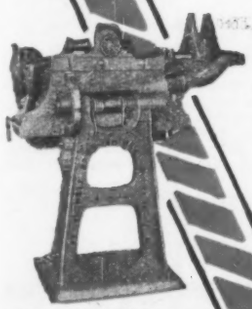
The successful repair man must do his work right and accuracy cannot be attained through makeshift methods.

The Carswell-Hammond Bench Stand will open the way to efficient, satisfactory and profitable work in repairing and overhauling Ford and Fordson motors.

The Carswell-Hammond Rear Axle Vise Stand enables you to do all that is to be done to a Ford rear axle at a convenient height from the floor in less than half the time required with ordinary equipment.

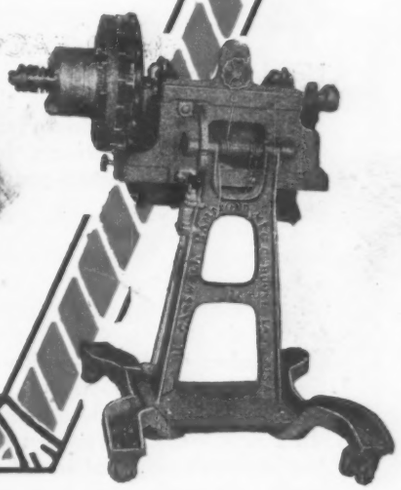
The Carswell-Hammond Connecting Rod Alignment Machines enable you to correctly align motor connecting rods in a way that kills that motor knock and causes your customer to pay his bill with a smile.

There is other Carswell-Hammond Equipment equally efficient and equally profitable. Write now for complete information and send us your jobber's name.



Bench Stand for Fordson Motors

Operates in the same way as our stand for Ford motors. Built of heavy material throughout. Saves 30% of time and labor in overhauling the motor. Shipping weight, 325 lbs.

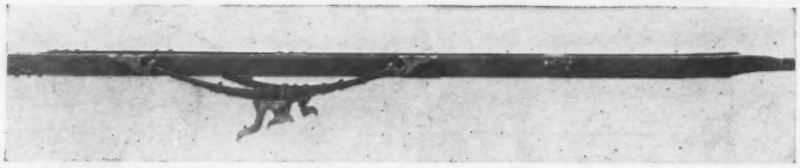


Manufactured by
Carswell-Hammond Mfg. Co.
Boone, Iowa

Sales Department
The Zinke Company
1323 Michigan Ave., Chicago

"Do Better Work at Less Cost"

Columbia



Columbia Slip-On-Frame and Side Springs, $125.00

The Columbia Slip-On-Frame and Side Springs make it possible to use the Ford Truck for many lines of business where the regular Ford truck would not be economical or satisfactory on account of its short frame and heavy spring. The attachment works independent of the Ford frame, the easy-riding side springs supporting body weight and loads up to 1,500 lbs. The Ford spring then acts—load is carried on five points and side sway, slipping of rear end and sub-sill breakage are eliminated.

Once installed—by simply slipping on frame and bolting at motor—no further care of any sort is required. Any type body requiring as much as 10 feet from the rear of seat can then be mounted on the frame and the truck is ready to perform all the work of far larger and more expensive trucks with the low initial operating and upkeep cost of the Ford. Hundreds of concerns use Columbia Slip-On-Frames for all work where loads are light and easy springs are needed to protect merchandise. The independent spring systems save the light and carry the heavy loads—a dual function.

COLUMBIA BODIES

We build all types of dump, stake and standard bodies to use with Columbia Slip-On-Frames. Write for complete information.

10 FEET

To accommodate any type of body for light, bulky goods. Special easy-riding auxiliary side springs to take care of such merchandise.



Ford Truck and Slip-On-Frame Assembled

HARD FACTS

No doubt you will find other attachments on the market today, but before they can be installed it is necessary to tear down the good work of Ford designers and substitute foreign parts, and when assembly is completed you have tampered with the sturdy Ford.

Columbia Slip-On-Frames

A device that makes possible a truck with ample body space to take care of large bulk requirements at one-third the cost of maintenance of the average truck of equal cubic body capacity. Frame and springs constructed of material of high quality in a factory with ample facilities for guaranteeing quick deliveries in sizeable quantities. All vibration, jerk and carrying strain is met by proper design and construction—tested in over two years of work under the most severe conditions. Columbia Slip-On-Frames and Springs have satisfied the most exacting requirements.

Remember—when installing a Columbia Slip-On-Frame you do not make a single change in the Ford Truck; just slip on the frame to take care of the length body desired and our side springs to take care of the light load, and in combination the heavy load.



FORD TRUCK COMPLETELY EQUIPPED WITH COLUMBIA SLIP-ON-FRAME AND SIDE SPRINGS

Selden Manufacturing Company

Slip-On Frames and Side Springs

DOUBLE THE CAPACITY OF ONE TON FORD TRUCKS

for Bakeries, Glassware, Laundries, Groceries, Furniture, Box Goods *etc.*

Make the Ford Truck Easy Riding

Slip-On-Frames and Springs, $125.00 complete—makes an easy riding, large bulk-capacity Ford Truck. Every Ford 1-Ton Truck which is handling light and bulky goods can be operated far more economically when a Columbia Slip-On-Frame is installed. Its bulk capacity can not only be doubled, but, because of the dual spring suspension, both light and heavy loads of fragile merchandise are transported with greatly decreased liability of damage. The long frame also relieves strain on axle bearings, saves tires, racking of body and generally increases the life of the truck. Repair shops catering to Ford business can easily sell Columbia Slip-On-Frames to owners of Ford trucks handling light and bulky goods.

All the Ford trucks in the territory doing this character of hauling are logical prospects. Columbia Slip-On-Frames will save money for them on every haul—a demonstrator will prove it on sight.

No Holes to Drill—No Wheels to Remove—Simply Slips On

The Columbia Slip-On-Frame can be installed in a short time **without drilling any holes in chassis frame or taking out any Ford parts.** Slip on the frame, bolt at motor, drop rear spring at the perch and set on spring brackets—then put back the Ford Spring and you are ready to attach the body.

Frame—Heavy steel channel 153″ long, 38″ wide, 4″ deep with heavy cross members and reinforced corner gussets.

DEALERS:

We Will Help Finance You

We are now placing distributors. Live wires wanted. For every state, city and county we have a real distributor's proposition on four big Ford specialties. Ready market. Quick sellers. Big profits, and, best of all, we will help to finance you. Write us and let our representative tell you all about it without a cent's expense to you.

ANOTHER FAMOUS

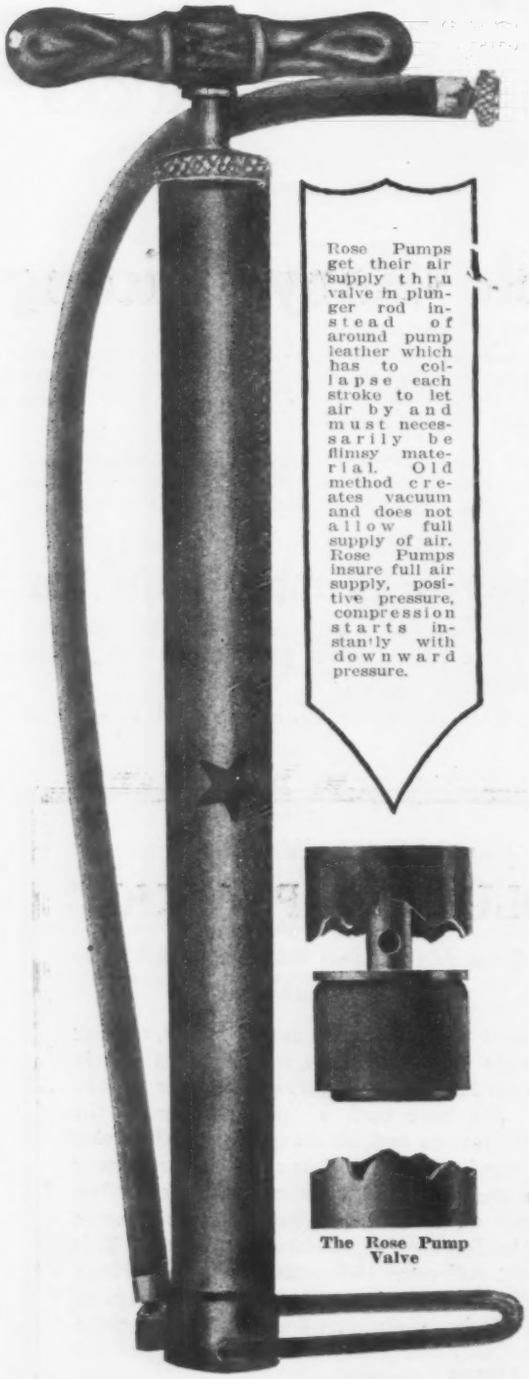
COLUMBIA PRODUCT

The Columbia Frame Extension and Side Spring Attachment

Lengthens your wheelbase to 155 inches, making it possible to carry bodies from 9 to 12 feet in length for light bulky loads; capacity for 1½-ton loads. We have built a large number of the extended frames and all are giving good service where used. Used by box factories, millinery houses and sash and door manufacturers. We also have a number giving good service in some of the leading lumber concerns in Detroit. This extension will carry 16-foot lumber easily. Firms now using it are Detroit Lumber Co., Board of Public Works, Wyandotte Lumber Co., Ferguson Lumber Co., and many others throughout the state. $165.00 Complete.

General Office, 21 Seden Ave. **Detroit, Mich.**

TWO of the GREATEST SELLING Almost Every Jobber



Rose Pumps get their air supply thru valve in plunger rod instead of around pump leather which has to collapse each stroke to let air by and must necessarily be flimsy material. Old method creates vacuum and does not allow full supply of air. Rose Pumps insure full air supply, positive pressure, compression starts instantly with downward pressure.

The Rose Pump Valve

1,500,000 ROSE PUMPS HAVE BEEN SOLD

in the last five years. That's the evidence of the hearty co-operation we have had from dealer and jobber—**which would not** have been given if the Rose Pump were not basically right and a better pump through and through.

ROSE TIRE PUMPS

THE VALVE THAT PUTS ALL THE AIR IN THE TIRE

Will satisfy the worst pump crank you can find. Their steel barrels won't jam and dent in the tool box and their valve construction is of such marked superiority over the old type that every one appreciates its great advantage as soon as you show it to them. A Rose Pump will raise a gauge to 200 lbs. pressure with a single stroke. Rose Pumps positively reduce the labor of tire inflation—that kind of a saving makes lasting friends and future sales.

Rose Tire Pump, 1¼ inch.....List Price $3.00
Rose Tire Pump, 1½ inch.....List Price $3.50

ROSE PUMP HOSE

Made from 5-ply fabric 17/32" outside, 3 1/6" inside with an inner wall of pure rubber. The hose is 24" long, fluted at one end with clamp on the other, and will fit nearly every tire pump made. The best hose that money can buy—millions sold yearly at a good profit. Ask your jobber about Rose Hose. List Price.....$0.75

We support Dealer and Jobber with the best manufacturing methods and materials that years of experience give to the manufacturers of tools of this kind PLUS points of construction such as the Rose Valve and Nozzle. Results—products that are raised above previous competition.

MANUFACTURED AND GUARANTEED BY

J. H. HANEY & CO.

HASTINGS, NEB.

LARGEST EXCLUSIVE TIRE PUMP AND

The Rose Line-Pumps-Grease Guns-Tank Drainers

ACCESSORIES in the WORLD and Dealer Handles Them

The Grease Gun Supplies Just As Great a Need

Every owner of car truck or tractor—every garage and service station requires a grease gun. And just as Rose Pumps have met the requirements for a better pump, Rose Grease Guns offer a quicker and much less wasteful method of grease handling. When your jobber offers you a Rose Grease Gun—"buy it." It is backed by the same organization and sales strength—sells as easily and in as great a volume as the famous Rose Tire Pump.

DEALERS

Because of the recognized leadership of Rose Pumps and Grease Guns, the Rose line has proved unusually profitable. Your merchandising success depends on the goods sold and profits made. The Rose line will be backed next year by a greater international adveritsing campaign than ever before. Get on the Rose Special.

ROSE GREASE GUNS

FITZ-EM-ALL NOZZEL—NO BACKING OUT OF GREASES

The taper nozzle fits all openings sufficiently to prevent all grease backing out of the nozzle as the gun is discharged. Packs the Universal of a car full of hard grease without waste. A selling point every user appreciates as well as the double leather valve with steel back support, making it possible to fill the pump with a single upward stroke and discharge it with one downward stroke.

Auto Grease Gun, 12½x1¼.....List Price $1.80

Trucks and Tractor Grease Gun, 19½ x1½.....List Price $2.50

Shop or Garage Gun, 24½x 1½, with handles to prevent slipping in the hands $3.50

Rose Grease Guns are steel and will not jam or dent in regular service.



FROM THE BARREL

TO THE MACHINE ONE STROKE

GREASE GUN MANUFACTURERS

Fan Belts - Clutch Leathers - Rebound Straps

SHOP EQUIPMENT That Boosts Profits



Ford Motor Stand

EKERN'S PORTABLE GARAGE GREASE GUN MODELS N OR K

Portable, practical and clean. The EKERN are the only hand operated guns on the market that will work any weight of grease as well as oil. Model K holds 20 lbs. grease or 2½ gals. oil. Model N holds 56 lbs. grease or 7 gals. oil.

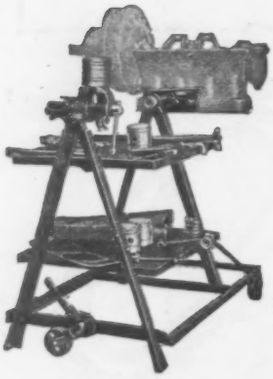
EKERN'S EMERGENCY AXLE STUBS

With any one of the Ekern Emergency Axles, a car with a broken axle can be placed on its wheels in a few minutes' time. Nos. 1, 3 and 4 are for Ford cars. No. 2 can be attached to any car in ten minutes. No. 5 is for one-ton Ford trucks.

EKERN'S PORTABLE WORK BENCH, MOTOR STAND, SHOP BENCH, MOTOR SUPPORT AND AXLE ATTACHMENT

EKERN'S PORTABLE WORK BENCH is a complete stand fully equipped with two large trays, a machinists' vise and motor stand.
EKERN'S MOTOR STAND is for repairing Ford motors.
EKERN'S SHOP BENCH MOTOR SUPPORT is for holding Ford motors on any shop bench.
EKERN'S AXLE ATTACHMENT for repairing axles will fit either the work bench, the motor stand or shop bench motor support.

Send for Our Complete Catalog—
It Means Extra Profits for You.
Your Jobber Can Fill Your Order.

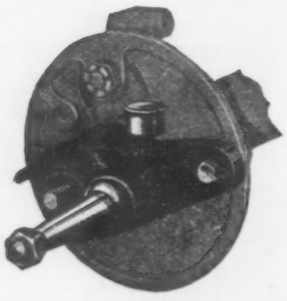


Portable Work Bench and Engine Stand

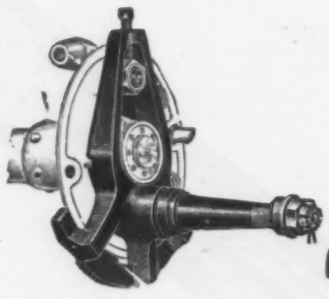


Axle Attachment for Work Bench, Motor Support and Motor Stand

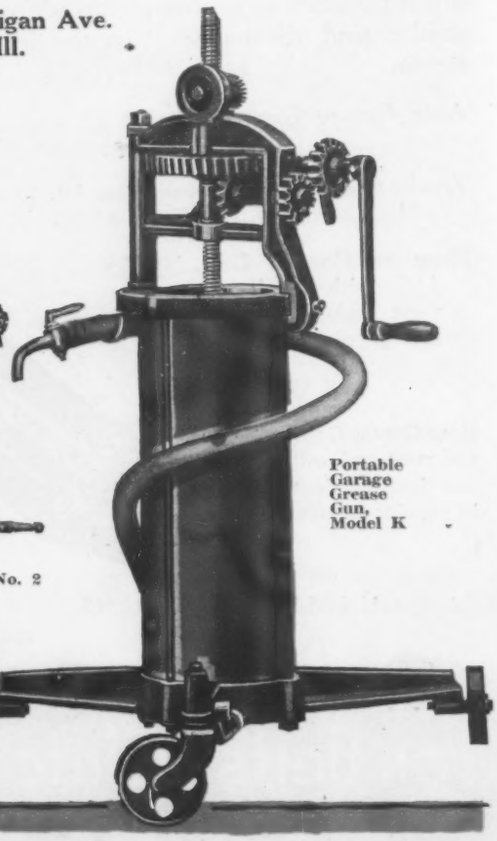
H. G. Paro Co.
1412-14 S. Michigan Ave.
Chicago, Ill.



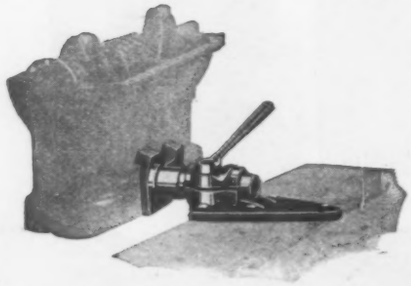
Emergency Axle No. 4



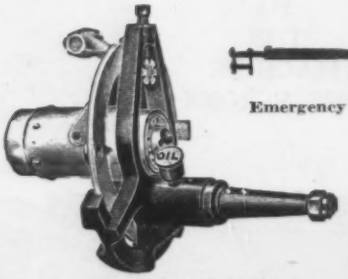
Emergency Axle No. 3



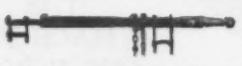
Portable Garage Grease Gun, Model K



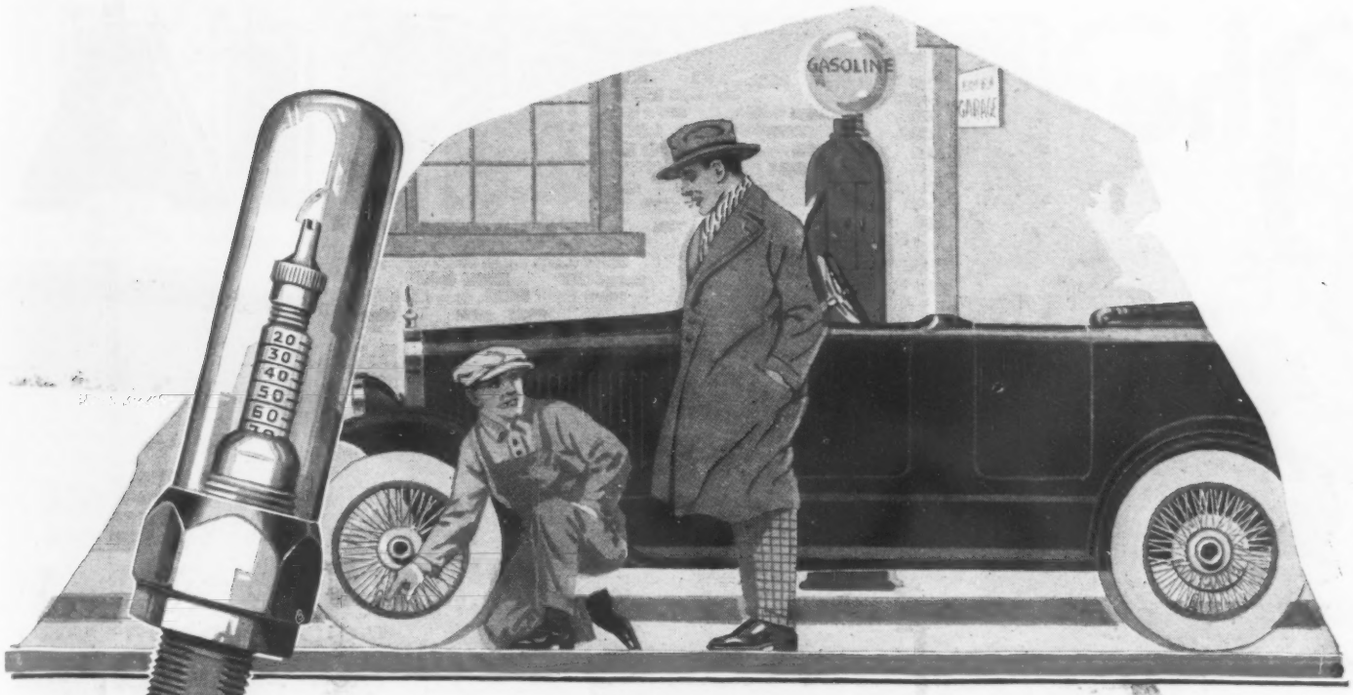
Shop Bench Motor Support for Fords

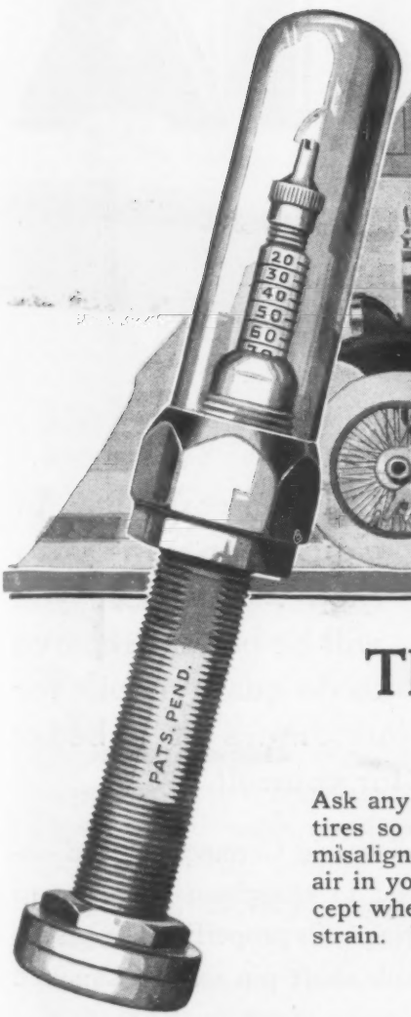


Emergency Axle No. 1



Emergency Axle No. 2





The Tirometer Keeps the Guess Out of Tire Inflation

Ask any tire manufacturer, any tire dealer, any auto repair man and he'll tell you why tires so seldom live up to their guaranteed mileage. It's not because of defects, or misalignment, or poor roads. It's due in most cases to your failure to keep as much air in your tires as you should. You cannot tell by merely glancing at your tire, (except when it is exceptionally deflated) whether it has enough air to prevent fabric strain. You must actually apply a pressure gauge to know.

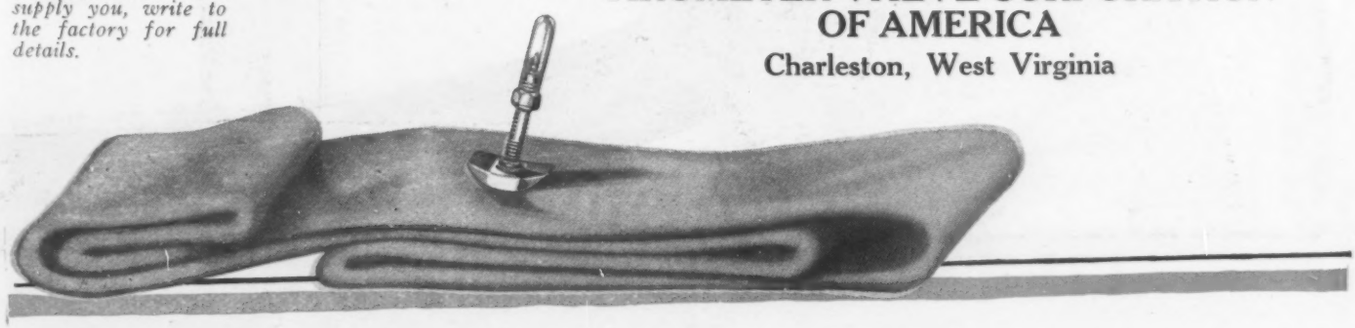
PULVERMAN
TIROMETER
"adds miles to tire life"
VALVE

It tells at a glance what your air pressure is. It saves you the trouble of unscrewing the dust cover, removing the valve cap and applying a pressure gauge. It adds many miles to the life of your tire and saves many hours of time and trouble in a season. It eliminates the need of a hand gauge.

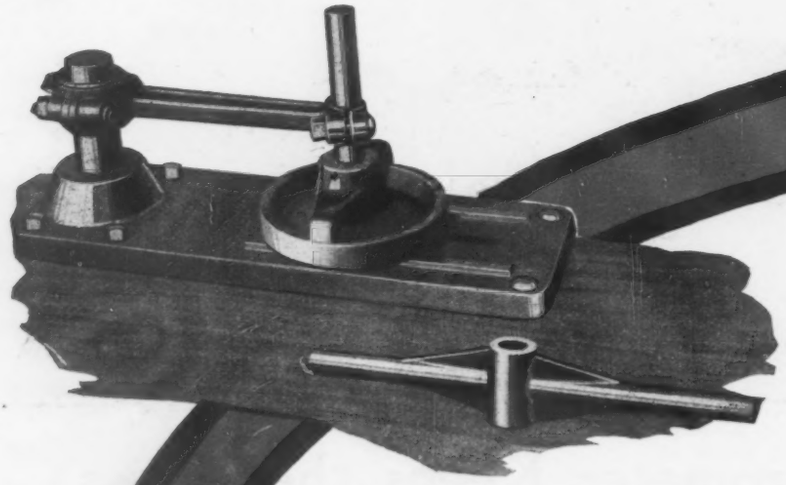
The Pulverman Tirometer Valve is an air pressure gauge and valve stem combined, taking the place of your present valve stem... It indicates at all times the number of pounds of pressure your tire is carrying. A transparent dust cap makes the reading possible at a glance. Tirometer Valves can be placed in your present Inner Tubes—simply remove present valve stem and insert Tirometers. In ordering, specify whether wire or wood wheels.

TO DEALERS:—
If the jobber in your territory cannot yet supply you, write to the factory for full details.

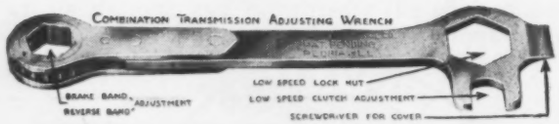
TIROMETER VALVE CORPORATION OF AMERICA
Charleston, West Virginia

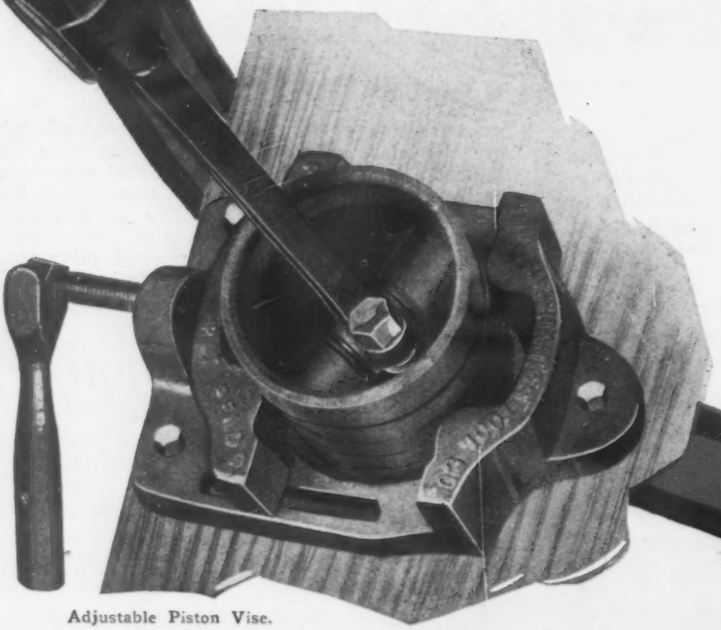


The PEORIA



Adjustable Connecting Rod Alignment Machine.





Adjustable Piston Vise.

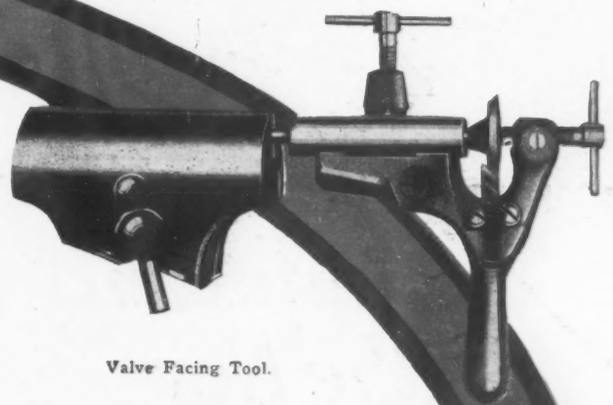
The Peoria line of Equipment in your shop means that you will be better prepared to do quality work for your customers at a better profit for yourself.

The Adjustable Connecting Rod enables you to straighten and line up connecting rods **properly.** The piston and crank shaft pin can be supplied for any make of car on the market.

The Adjustable Piston Vise does away with makeshifts and lets the mechanic work on parts from all positions. This results in a big saving in the mcehanic's time—and a consequent bigger profit for you.

LINE of Shop Equipment

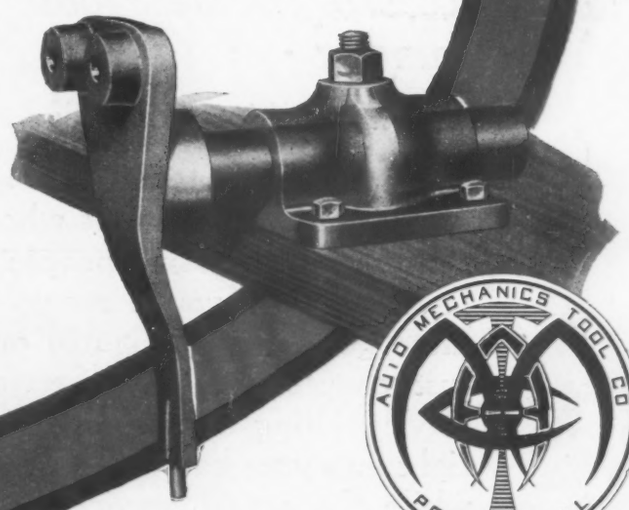
The Valve Facing Tool is revolved around the valve, the sleeve of which is held **securely** in vise. A set screw clamps sleeve and tool together. Both tool and sleeve revolve. A feed screw is provided on the end to feed valve to cutter.



Valve Facing Tool.

The Motor Block Support for Fords is an ideal support for holding motor block in position while adjusting magneto and rebabbitting bearing. Does away with lost motion. Every tool is within reach—which means higher efficiency, convenience and profits.

The Ford Motor Block Support.



The Combination Transmission Wrench is the only tool required to take the transmission out of a Ford car. Sprockets of different sizes are furnished to fit the ratchet end of wrench. This gives wrench a wider field of usefulness.

Repairmen: See our exhibit at Chicago Automobile show with L. Lawrence and Co., Sections 25 and 26, Armory Balcony and with same firm at Minneapolis show. It will pay you to investigate the time saving Peoria Line of equipment. Write for details, prices.

Exhibited and sold by L. Lawrence & Co., New York, Detroit, Chicago. Chicago Auto Show, Sections 25, 26, Armory Balcony. Also exhibited at Auto Show, Minneapolis.

AUTO MECHANICS TOOL CO PEORIA ILL TRADE MARK

Auto Mechanics Tool Co.
PEORIA, ILL.

USL SERVICE STATIONS



Electric Equipment Co.
Los Angeles, California.
One of the chain of nation-wide USL Service Stations.

Announcing the New
USL DEALER OPPORTUNITY

for Automobile Dealers, Accessory Dealers and Garages . . . . .

HERE is a good business opportunity for you to distribute further satisfaction among your customers and make extra money with no additional overhead and practically no extra effort.

There's a potential asset for you in our established System of USL Service Stations whose success has been built up by continuously pleasing people with a better battery-service. We have ready for you a money-making multiplier that will write more good-looking figures on the cheerful side of your ledger. Just couple our USL Service with your battery-selling and service-selling opportunity which car-owner acquaintance puts right into your hand. Then you can share in the battery-profit while the actual service work is capably performed by your USL Service Station.

All motoring folks need battery and electrical service—all need new batteries sometime. Through your car-owner customers you can make sale after sale of USL Batteries and arrange for USL Service. You can carry on this good work of

selling without devoting time or energy especially to it, without any expert battery-knowledge. You. USL Service Station will do the work and supply the satisfaction needed to keep your patrons "battery happy."

What you will be selling as a USL Dealer under the USL Service Stations will be *right*—not merely a storage-battery, but battery-SERVICE of which the battery is but an essential part.

USL Service brings to the ultimate owners a Service Policy which they have recognized has a "differentness". For USL Service Stations are under no factory-pressure to sell stipulated quotas of batteries within fixed periods—are not forced to make sales but *are* pledged to this principle—

"The longer we make your present battery last the surer we are of eventually selling you a new one."

USL Service Stations are instructed *not* to sell a battery when a repair is advantageous to the owner, and all repairs must be guaranteed for eight months. Service, Service all the time—written into every instruction and agreement, with our business eye always on the principle that the patron you keep on satisfying is the one you profit from in the long run.

We are proud of our USL Service Stations. They are worthy representatives. Their success is evidenced by the fact that they are constantly moving into larger quarters—and into buildings of their own, to accommodate their fast-growing patronage. These facts mean ready-made trade assets for you.

Hundreds of thousands of USL-equipped cars now on the road gravitate toward USL signs. Hundreds of thousands more prefer the superior USL Service to keep their batteries working. Why not avail yourself of the selling opportunity which these things make easy under our new Plan?

Better see the USL Service Station in your town at once or write for "The New USL Dealer Plan."

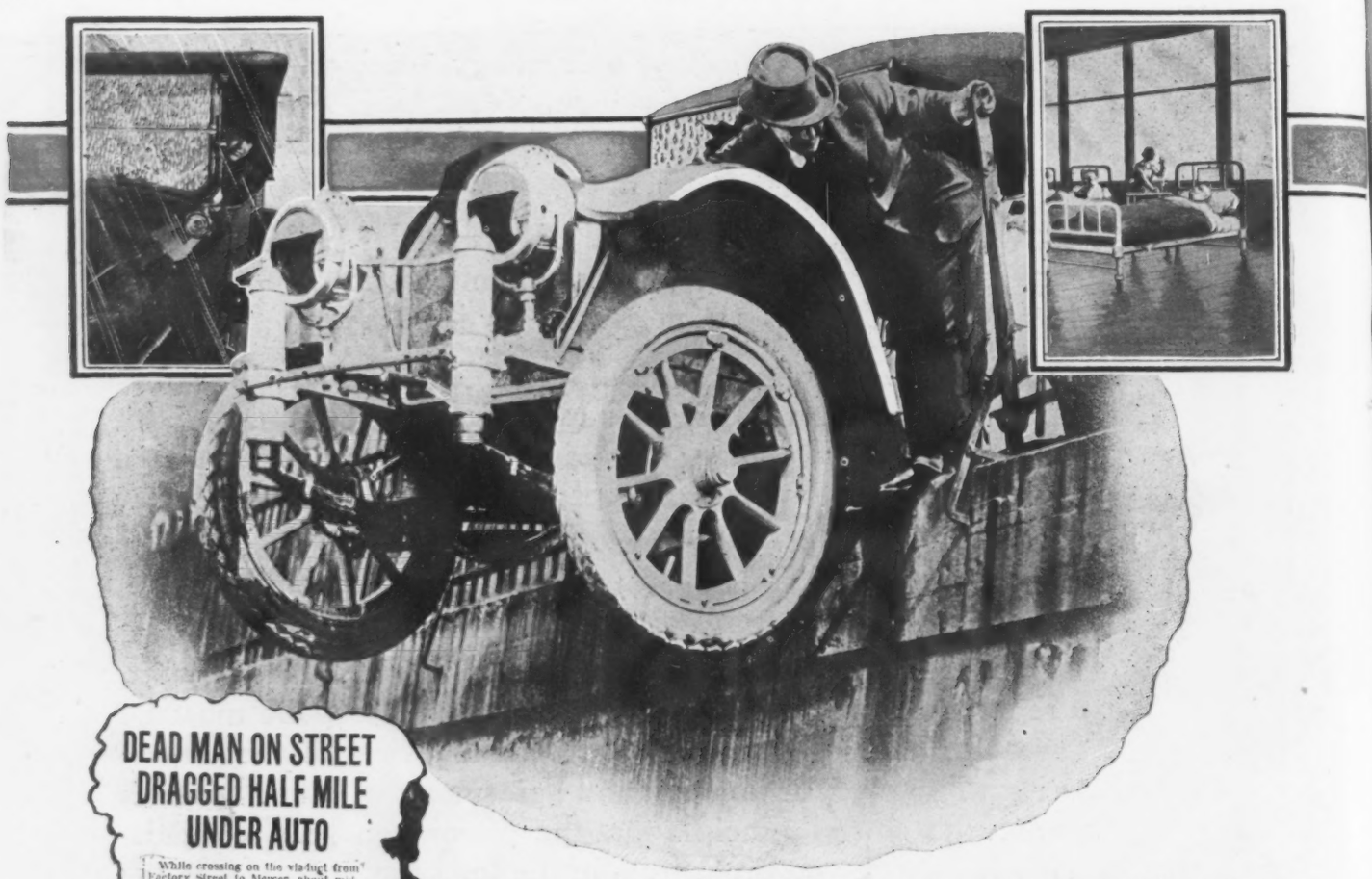
U. S. Light & Heat Corporation, Niagara Falls, N. Y.

USL TRADE MARK

U. S. LIGHT & HEAT CORPORATION

FREE *Our 50-cent Battery Book that answers every battery question. It's a book you can't afford to be without if you own or drive an automobile. It's free if you mention the make and model of your car.*

storage batteries



DEAD MAN ON STREET DRAGGED HALF MILE UNDER AUTO

While crossing on the viaduct from Factory Street to Mercer, about midnight Tuesday, Mrs. Rosie Colligan, 38 years old, of 177 Baldwin Avenue, was struck by an automobile and rendered unconscious, receiving injuries on the leg and side of the head. When she recovered she found that her escort, William Fitzhenry, 26 years old, of 354 Mercer Street, had disappeared. She looked around but could see nothing but a touring car in the distance, on the viaduct.

Yesterday morning Mrs. Colligan went to Fitzhenry's home and there learned that Fitzhenry had been found dead in the street at Fairview and Monticello Avenues shortly after she had been struck by an automobile.

Two men, Adolph Schadler of 35 Gautier Avenue and J. Vloant of 723 Willow Avenue had notified Patrolman Billington of the Hudson County police at 12:20 Election Night that there was a man lying in the street at Fairview and Monticello avenues, which is about a half mile from the point where Mrs. Colligan was struck by an automobile.

Comparing the time when the Colligan woman was struck down with the time that Fitzhenry's body was found on the street a half mile away, and considering the position of his body, it is thought evident by the police that Fitzhenry was struck by the same car that struck the girl, but that while she received a glancing blow, he was [illegible] through the [illegible] he was caught by his clothing under the car and dragged about half a mile, his clothing finally giving way at Fairview and Monticello avenues. The police think that he could have been dragged in this manner by a large touring car and that possibly, owing to the fact that it was raining hard at the time, the driver might not have seen the man nor possibly even known that Fitzhenry was being dragged by the car.

THE STEAM TEST

You Can Prevent Accidents By Having a Clean, Clear Windshield All the Time

The news clipping and the actual photograph are typical of accidents that happen every day. And you will find that a majority of these preventable mishaps are due to blurred vision.

In most cases the excuse of the driver is "I could not see ahead of me in time to stop the car."

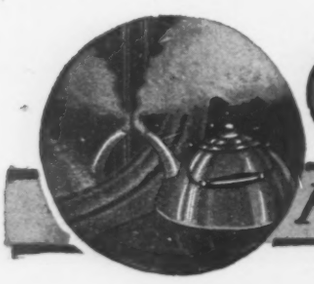
There is absolutely no excuse for such an answer. It is possible to have a clear, clean windshield all the time, regardless of snow, sleet, rain, fog or mist.

You can drive in safety and not imperil the lives of your passengers or the pedestrian when you have clear vision.

How to Avoid Accidents

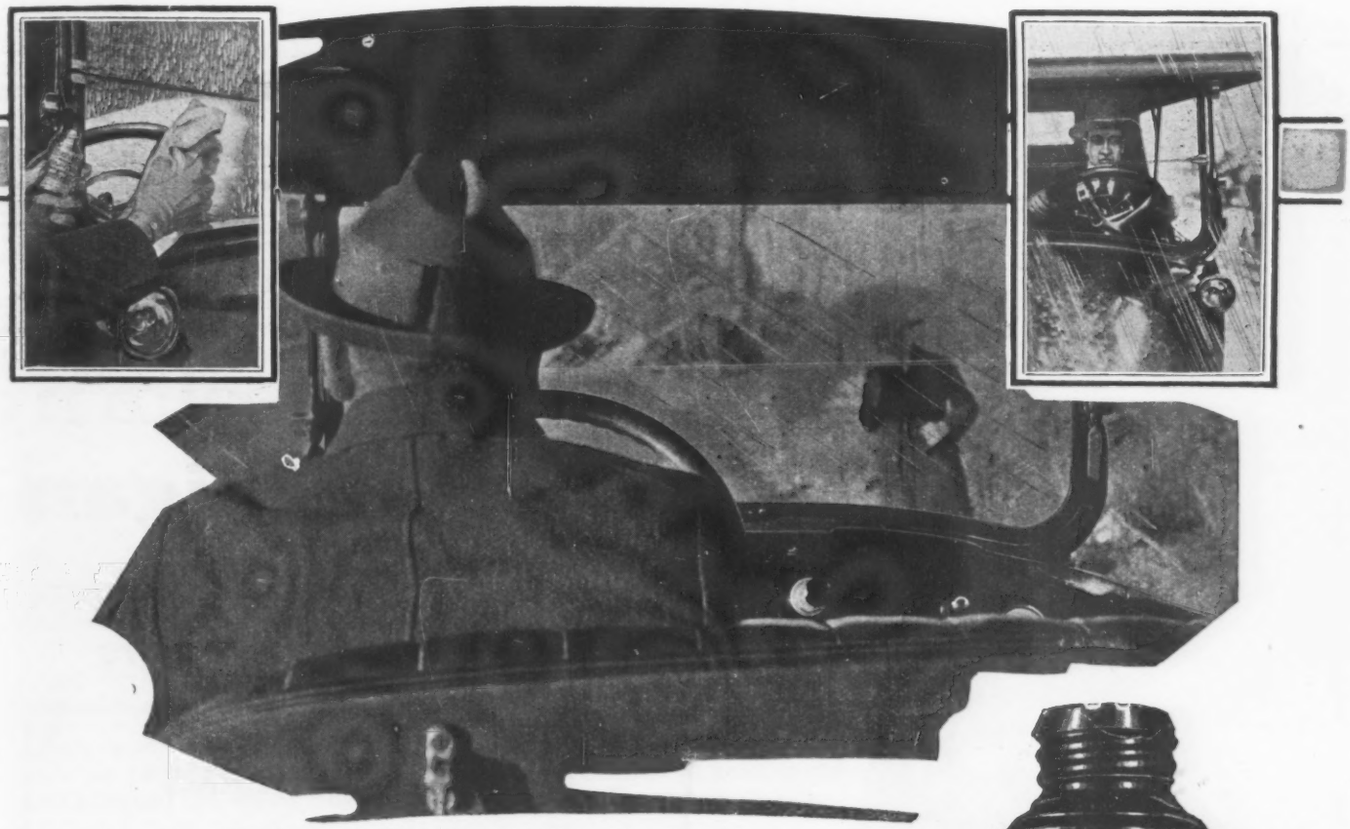
Put a little Cleroline, the new chemical compound, on a cloth, sponge or piece of tissue paper and rub it on the outside of your windshield. You are then prepared to drive out in any kind of wet weather and see clearly everything before you.

One application will last for many hours through the most severe rainstorm. No matter how hard the rain, sleet or snow beats on the windshield it will not stick. You get perfect vision all the time through mist and fog.



CLEROLINE

Prevents Moisture from Adhering to Windshields



Foggy, Misty and Rain-Covered Windshields Cause Expensive Accidents

When you have Cleroline on your windshield and the rain or snow beats heavily on it, the water or moisture flattens out instead of beading up. This leaves a clear, smooth surface for the driver to see through.

Permits Driving With Both Hands

You need both hands to drive during bad weather. Cleroline keeps the windshield clean and does away with that disagreeable job of scrubbing off the water every few minutes. No rattle or vibration to Cleroline.

Sells on Sight

Display a dozen cans of Cleroline in your window and our new small attractive sales display card on your counter and the sale is half made.

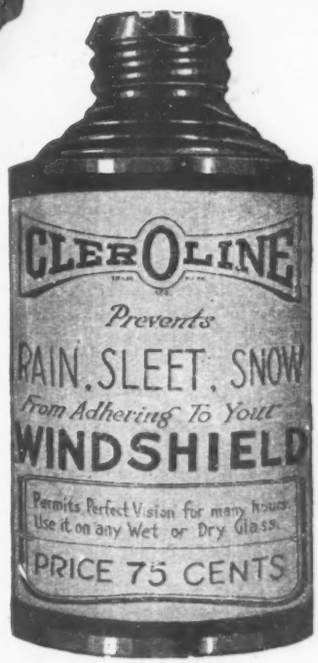
Cleroline retails for 75c. Enough in each can for about 150 applications. You not only make a generous profit, but win a permanent customer. If your jobber cannot supply, write direct.

Manufactured by

The Cleroline Chemical Co.

507 Fifth Ave., New York City

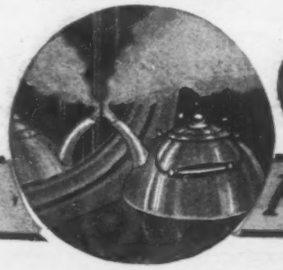
Export Office 250 N. 54th St., New York City



CLEROLINE

Not a Soap Not a Grease
But a Chemical Compound.
Requires No Mechanical Devices.

THE STEAM TEST



CLEROLINE

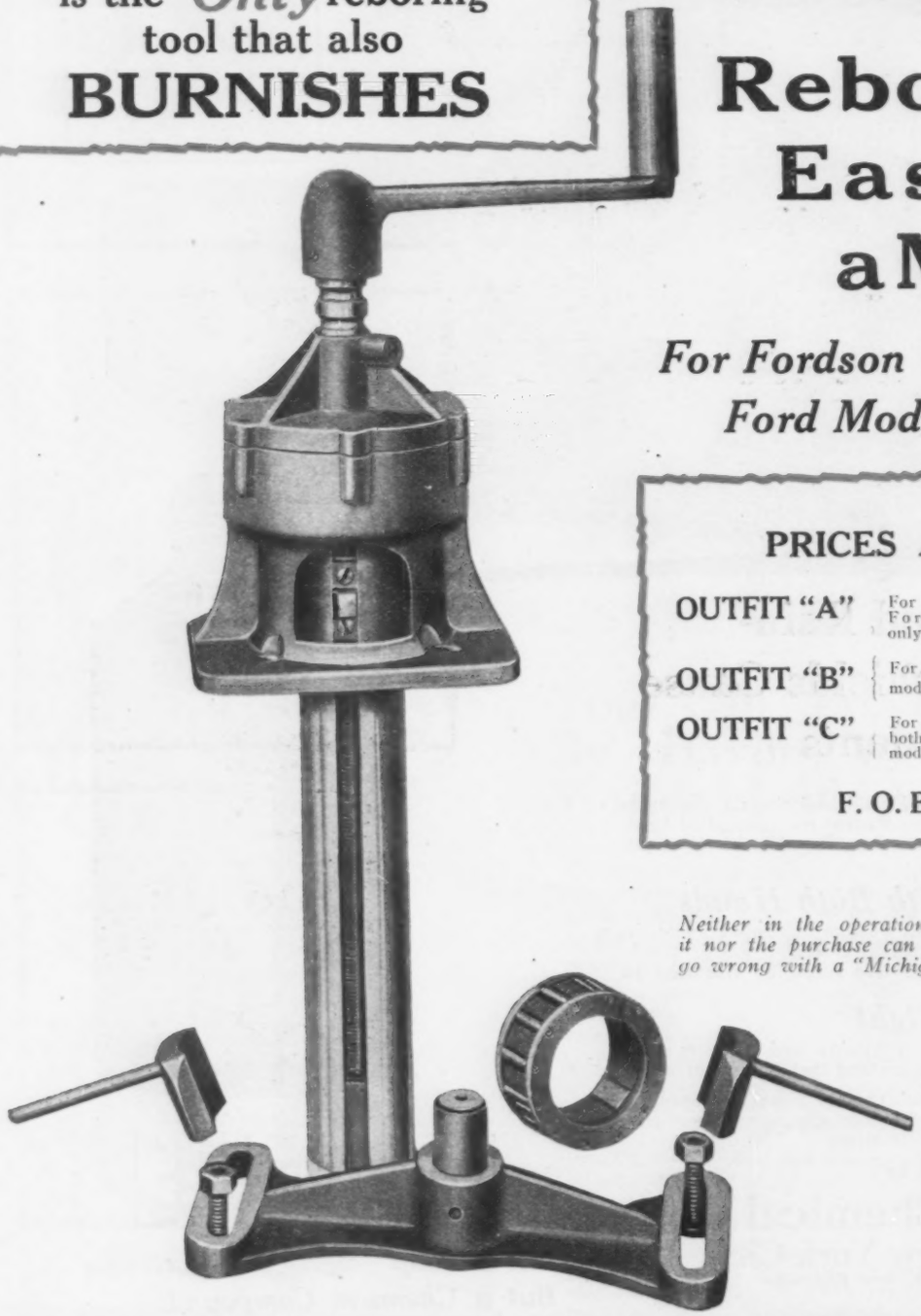
Prevents Moisture from Adhering to Windshields

The
"MICHIGAN"
is the *Only* reboring tool that also
BURNISHES

IT'S EASY WITH

Rebore Cylin Easier and a Michigan—

For Fordson Tractor Cylinders
Ford Model T Cylinders



PRICES AND TERMS

OUTFIT "A"	For reboring and burnishing Fordson tractor cylinders only.	$150
OUTFIT "B"	For reboring and burnishing model T cylinders only.	$150
OUTFIT "C"	For reboring and burnishing both Fordson tractor and model T cylinders.	$225

F. O. B. DETROIT

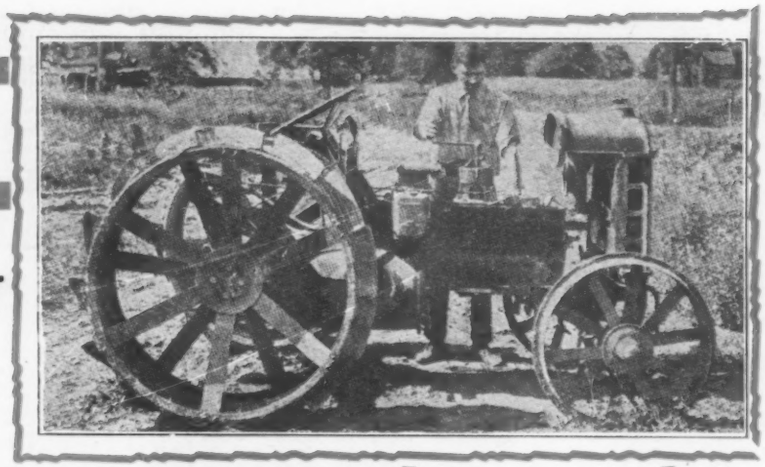
Neither in the operation of it nor the purchase can you go wrong with a "Michigan"

PROMPT DELIVERY

DISTRIBUTORS

C. E. Freeman Tractor Co., 309 Center St., Little Rock, Ark.
Wm. L. Hughson Co., 1101 Van Ness Ave., San Francisco, Calif.
David T. Bussey, 188 Peachtree St., Atlanta, Ga.
Dayton Keith, Bloomington, Ill.
Jennings Auto Sales Co., Springfield, Ill.
Indiana Tractor Co., 1327 East Washington St., Indianapolis, Ind.
Hubbell Auto Sales Co., Court and Niagara Sts., Saginaw, Mich.
G. T. O'Maley Tractor Co., McGee and 18th St., Kansas City, Mo.
Thomas J. Northway Co., 100 Exchange St., Rochester, N. Y.
E. M. Vanderslice, 223 North Main St., Tulsa, Okla.
Gash Stull & Co., 1915 Market St., Philadelphia, Pa.
Du Pre Auto Co., 806 Gervais St., Columbia, S. C.
Hubb Diggs Company, Fort Worth, Texas.

"MICHIGAN"



A "MICHIGAN"

ders Like New Quicker On

there's a reason



The "Michigan" is the **only** reboring tool that also burnishes—that supports the cutter at top and bottom—that locates the cutter centrally in the cylinder and keeps it there—that hardens and smoothes the cylinder walls—that can be used as effectively.

In the Field as in the Shop

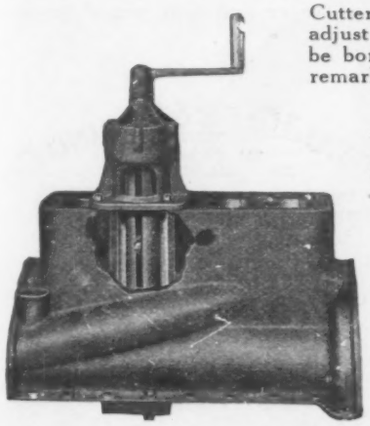
A Michigan rebores cylinders so that they are, in finish and working qualities, just like new. The cutter support and method of keeping the cutter central **the entire length of the bore** insures accuracy.

Our patented method of burnishing after boring, definitely gives longer life to the cylinders. The cylinders are exactly as good as when they left the factory the first time. Think what such service means to your customers, and what it will mean to you in direct profits and the building of prestige and good will.

USE It Anywhere — Any Time

In the shop or in the field the "Michigan" is a proved-in-service time-saver. Operated by hand, it averages twenty-three minutes to a cylinder. Put on a drill press and turned by power, this time is cut to fifteen minutes. Hand operation is as easy as it is quick—no broken backs from stooping over.





Cutter has one single point, is of high speed steel, simple and easy to adjust and keep adjusted. From two to three hundred cylinders can be bored before you need to change the cutter—reducing cutter costs remarkably. With the locating blocks provided tool

Can Be Located in Less Than Five Seconds

The "Michigan" is easy to operate, fast in service and retains these features throughout its long life.

Act Today—Now

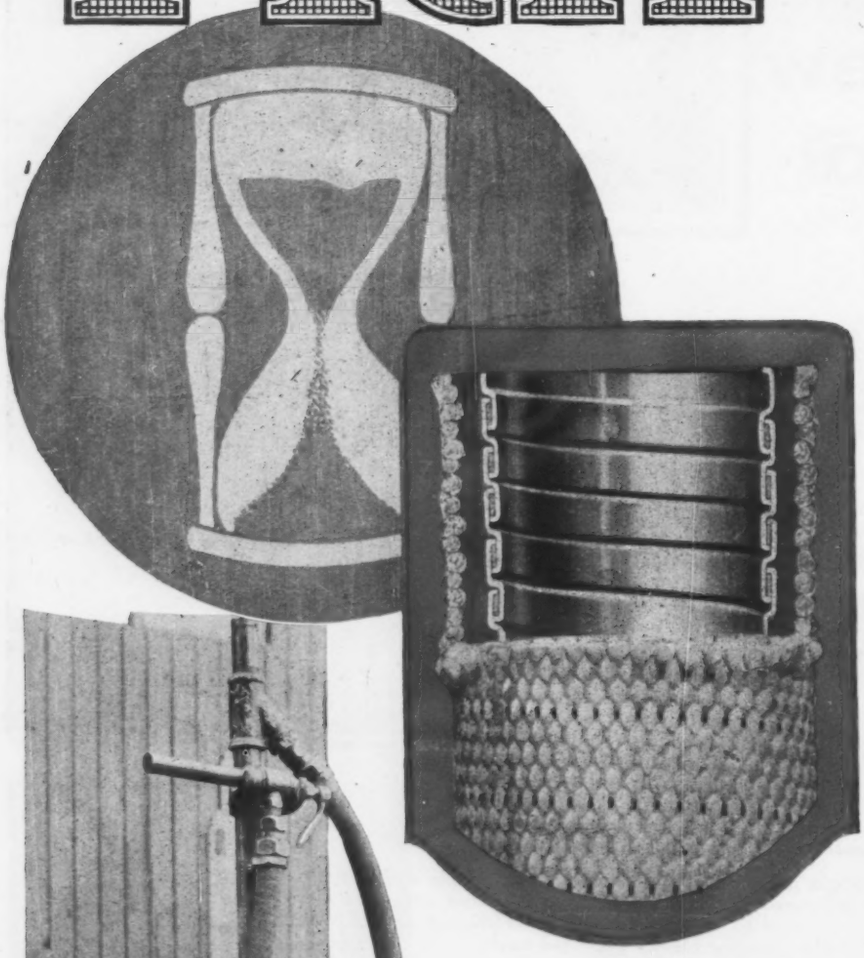
MICHIGAN MACHINE CO.

DETROIT, MICH., U. S. A.

REBORING AND BURNISHING TOOLS

TRIPLEX

XXX GASOLINE HOSE XX



Section of Triplexd hose showing construction.
Metal, rubber and fabric—not three separate layers, but one inseparable unit.



The cut to the left shows one of the Triplexd veterans in gasoline service. It is owned by the Irving Garage, 1005 Ave. Q, Brooklyn, N. Y. It has been in service since June 5, 1915.

TRIPLEXD differs from other gasoline hose in that IT LASTS LONGER. This fact should be enough to sell Triplexd to every gasoline and oil pump user in the country, for the biggest annoyance and expense he is up against in connection with pump maintenance is that ordinary gasoline hose gives out so quickly and requires frequent replacements.

The difference between Triplexd and other hose lies in its exclusive construction whereby it resists weather, wear and hard usage, and prevents the impregnation of the rubber with gasoline which otherwise would cause the rapid deterioration.

The AVERAGE life of a length of Triplexd hose is over two years. We have records of many lengths that are giving three and four years' service and over.

METAL HOSE & TUBING CO.
INCORPORATED
235 Tillary St.
BROOKLYN, N. Y.

XD The Hose That Outlasts them All

It pays to use Triplexd hose. When you order a gasoline or oil pump be careful always to SPECIFY TRIPLEXD hose equipment. When you require hose for replacement, state definitely that you want "Triplexd."

The pump makers listed on the right carry Triplexd in stock and will gladly furnish it to you with their pumps.

Those pump makers whose names are marked with asterisk have adopted Triplexd as standard equipment, with their pumps, and furnish it exclusively.

They have learned that it pays them to do this because Triplexd is the only hose that will live up to the standard of quality they have set for their pumps.

List of manufacturers of gasoline and oil pumps furnishing Triplexd with their pumps.

Allen Pressure System.

S. F. Bowser Company.

*Clear Vision Pump Co.

*Dayton Pump & Mfg. Co.

*Doran Mfg. Co.

Farr Hydraulic Oil System Co.

*Fleckenstein Visible Gasometer Co.

*Gilbert & Barker Mfg. Co.

*Guarantee Liquid Measure Co.

*Groetken Pump Co.

*Milwaukee Pump & Tank Co.

*National Oil Equipment Co.

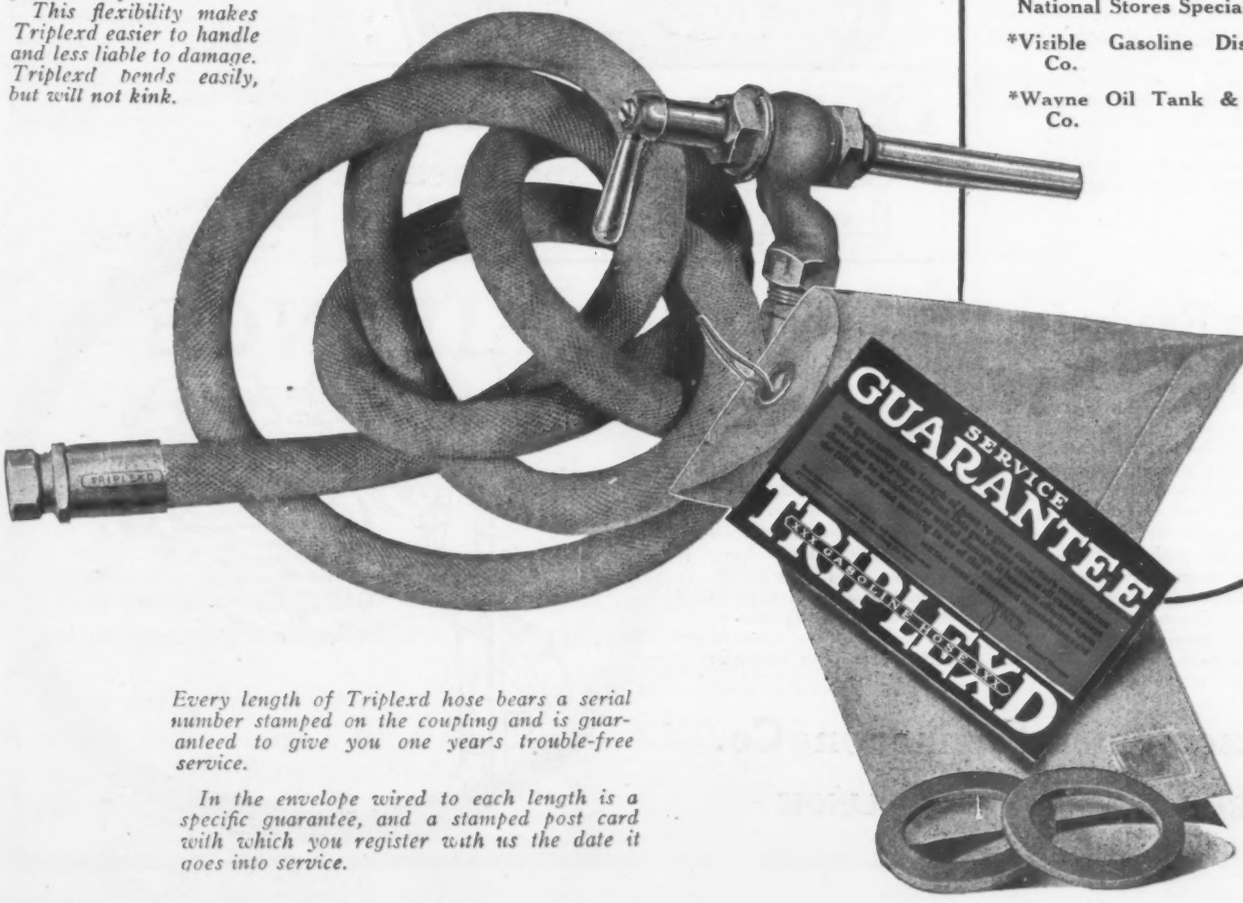
National Stores Specialty Co.

*Visible Gasoline Dispenser Co.

*Wayne Oil Tank & Pump Co.

Triplexd is the most flexible hose made. No other hose maker could twist his hose into a knot like this without damaging it permanently.

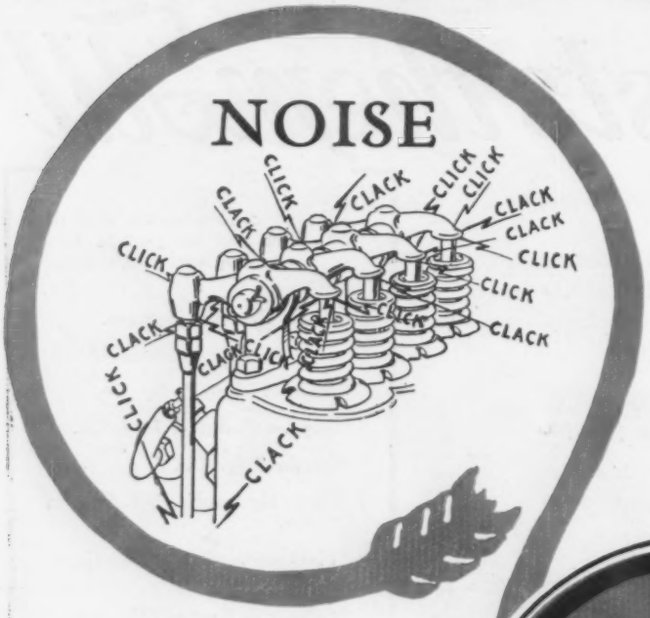
This flexibility makes Triplexd easier to handle and less liable to damage. Triplexd bends easily, but will not kink.



Every length of Triplexd hose bears a serial number stamped on the coupling and is guaranteed to give you one years trouble-free service.

In the envelope wired to each length is a specific guarantee, and a stamped post card with which you register with us the date it goes into service.

90% OF THE NOISE OF OVERHEAD VALVES ELIMINATED AND POWER INCREASED

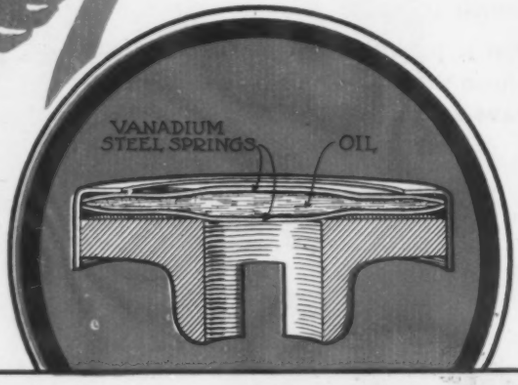


There have always been two big objections to the overhead-valve motor—the NOISE NUISANCE and the necessity for frequent adjustment of the valves. Numerous attempts have been made to overcome these undesirable features, but it remained for the Soenksen Spiers Co. to evolve an entirely different and successful method of noise absorption—based on the positive deadening principle of a cushion of oil.

Oil Cushion Tappets have now been under continuous test for for over two years. In every installation the deadening oil cushion has given to the overhead-valve motor a quietness of operation almost equal to that of the most finely adjusted slide valve motor. And even better, from an operating standpoint, Oil Cushion tappets have taken up all lost motion in the valves, increasing the power and response of the motor and greatly reducing the necessity for valve adjustments. They have, in all truth, completed the overhead valve motor where the engineers left off.

What They Are

Oil Cushion Tappets consist of a solid base which fits snugly on the top of the valve stem, and on this base rest two Vanadium Steel dished springs forming a full elliptic spring held in place by a steel cap. The cap is filled with oil and when the motor runs this oil is drawn between the springs on the upstroke of the valve, and as rocker arm strikes it hits on a cushion of oil. A portion of the oil remains within the container at all times—the excess being taken in and forced out on each stroke.



What They Do

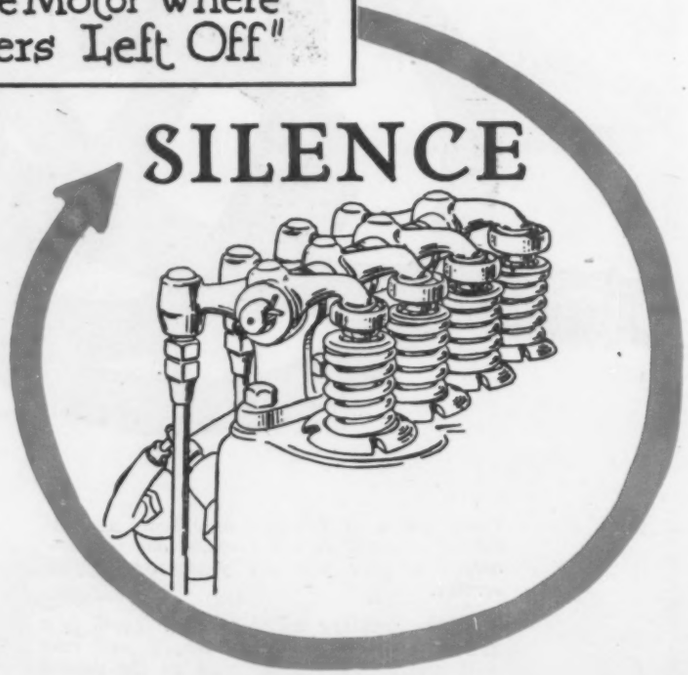
Allow absolutely no lost motion in any part of the valve mechanism. Give your motor a more positive valve action—because of the elimination of all lost motion. Reduce wear and tear on the valve action and adjustments of the valves. Give you a silent motor with more power. Give you infinitely more pleasure from your car.

OIL CUSHION TAPPETS

"Complete the Motor Where the Engineers Left Off"

Soon Ready for Distribution

Oil Cushion Tappets will soon be available in sizes to equip several of the most popular types of overhead-valve motors. Production facilities have been increased and advertising and sales plans are nearing completion. By the time this advertisement is published complete sales literature will be off the press and ready for those interested in this much-sought-for overhead-valve improvement. Today the car of character is quiet—and quietness of operation is a much desired feature. Oil Cushion Tappets will be in instantaneous and great demand—the degree of enthusiasm in which they already have been received by manufacturers of overhead-valve motors and by the trade to whom they have been demonstrated is a certain indication of the consumer popularity they will quickly attain. We will be glad to forward complete information on Oil Cushion Tappets to interested dealers and jobbers the moment our literature is received.



Soenksen-Spiers Engineering Co.
AUTOMOTIVE SPECIALTIES
AURORA, ILLINOIS

Now I get the good of my Spotlight



It's inconvenient and dangerous to keep reaching for the spotlight when driving

The JIFFY SPOTTER

Price $2.50

brings spotlight control down close to the steering wheel.

With it the spotlight fills the need for quick light wherever you need it, without taking a hand off the wheel or the eyes off the road.

The Jiffy Spotter adjusts to fit any car. It is good looking; made of finest materials; strong and durable; lasts for years. Ball and socket joint, controlled by thumb screw, permits setting of handle in any position or angle, and allows handle to be swung out of way when not in use.

Every car with a spotlight is a red hot prospect for a Jiffy Spotter.

Every car without a spotlight is a doubly good prospect for a sale, with the Jiffy Spotter to make it effective.

Sales Department

THE BAILEY-DRAKE COMPANY, Inc.

1118 Michigan Ave., Chicago

THE BAILEY-DRAKE COMPANY,
1118 So. Michigan Ave., Chicago.

Gentlemen: ☐ Enclosed is $2.50 for a Jiffy Spotter
☐ Send me circular on the Jiffy Spotter

Name .....

Address .....

Dealer's Name .....

☐ Mark X here, dealers, if you want sample billed at dealers' price. Give jobber's name.

.....

NAZETT

The value of burning-in bearings is recognized — the question of what machine is the important one.

Here's Why It Should Be a Nazett

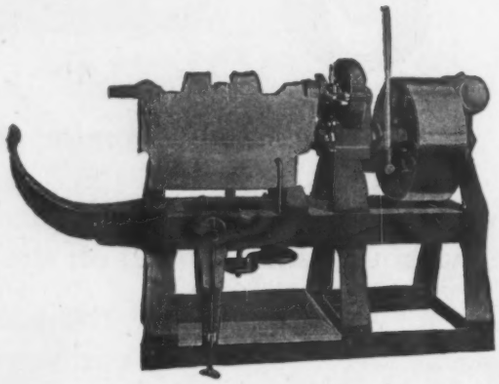
First: It permits the mechanic to remove the crank shaft from the car without unclamping the motor from the block.

Second: The clamp on the Nazett machine is on one side only. Not necessary for the mechanic to walk around the machine every time he wants to loosen up the block.

Third: The Nazett is especially compact, and takes less room in a garage than any other machine.

Fourth: The only machine built high enough from the floor to permit moving and replacement of pistons without removing the block.

Fifth: Every bearing on the motor is accessible when the motor is clamped down on the block. No interfering arm making it necessary to remove the motor from the block to get at bearing.



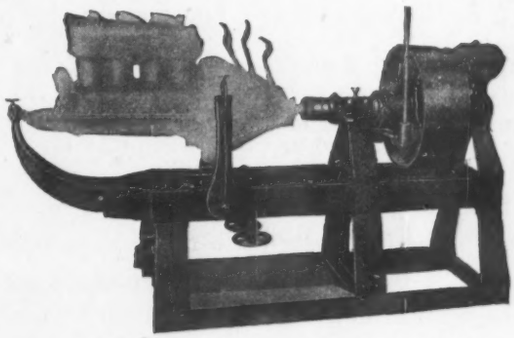
"Model F Burning-in Fordson Bearings"

Sixth: The bearings can be tightened up while the machine is in motion. In other machines, the motor must be removed from the block, before the bearings can be taken up.

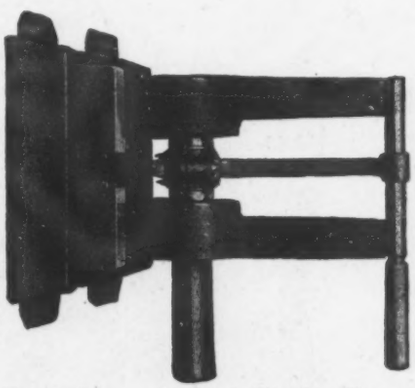
NAZETT

Other Exclusive Advantages of Nazett

Seventh: The Nazett machine is equipped with an expanding clutch, made of hard kiln dried wooden shoes, practically indestructible, and needs no adjusting. However, provision is made for adjustment, making it doubly safe. When a mechanic is burning-in the bearings, he must be able to move the motor to tell whether or not the bearings are sufficiently well burned in. To do this on a Nazett Machine, he takes the clutch lever and inserts it in a pulley for that purpose. While using the lever to test the machine, he cannot throw the clutch in and thereby cause trouble. Send the coupon for full particulars about Nazett Combination Burning-in and Work-out Models.



"Model E Working-Out Motor"



Nazett Connecting Rod Aligning Fixture

Nazett Connecting Rod Aligning Fixture

It is a fact that about 60% of the connecting rods coming from the factories are out of alignment. A connecting rod should be tested before placing or replacing in the motor.

Sprung connecting rods will invariably cause a slap in the motor. Experience has proved that the majority of motor knocks are caused by connecting rods being out of alignment.

This Nazett tool is a necessity in every shop and will pay for itself in a very short time. Send coupon for full particulars.

Sold By Leading Jobbers. Prices F. O. B. Factory

MANUFACTURED BY

NAZETT MFG. CO., Eldora, Ia.

SALES DEPARTMENT

THE BAILEY-DRAKE COMPANY

1118 SO. MICHIGAN AVE., CHICAGO

BRANCH OFFICES

New York	San Francisco
Detroit	Kansas City
Dallas	Minneapolis
Atlanta	Seattle

The Bailey-Drake Co., Inc.,
1118 So. Michigan Ave., Chicago.
Send us full particulars about Nazett Combination Burning In and Working Out Machine.
Name .....
Address .....

A MENTOR AUTO HORSE

Built Rugged and Strong for Holding Up Automobiles

Supporting 3,000 to 30,000 pounds is no joke. To put out a horse guaranteed to hold up 30,000 pounds takes rugged strength. Mentor Auto Horses have it.

You can put them to the hardest strain with the absolute knowledge that they won't collapse, won't tip over, won't loosen at the joints. THEY STAND THE GAFF.

The wood that goes into Mentor Auto Horses is carefully selected hardwood and of the toughest variety—it is weather dried, not merely kiln dried—the bolts are large and strong.

Every garage needs several sets of Mentor Auto Horses. Every car owner needs at least one set. The set costs little more than one good jack—too little to permit taking chances with blocks, boxes, cans, etc.

Mentor Auto Horses are shipped knocked down. The small picture shows a set ready for its journey from the factory. They are put together with a monkey wrench.

The coupon below will bring you full details. Send it in at once.

Sales Department

THE BAILEY-DRAKE COMPANY, Inc.

1118 S. Michigan Ave., Chicago, Ill.

COUPON:

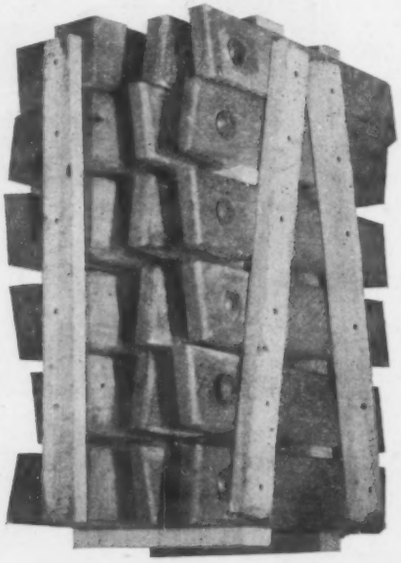
The Bailey-Drake Company, Inc.,
1118 S. Michigan Ave., Chicago, Ill.
I'd like prices and full particulars about MENTOR AUTO HORSE—no obligation to buy, of course.

Name .....

Address .....



Tested to 35,000 Pounds



Acids Don't Harm This Apron It's An Invincible Acid-Proof

Here's an apron that's really acid-proof, that is guaranteed to stand the test in the Battery Station



For years chemists have sought to produce an acid-proof apron that would be pliable. Our chemists solved a great problem when they produced "Invincible" acid-proof fabric. For it is not only 100% acid proof, but pliable and economical in price.

It is so durable that it gives highest satisfaction under most severe conditions, such as pickling and galvanizing rooms, soldering, enameling, plating, etc., where the ordinary rubber apron has been little if any help.

Furnished complete with neck tape and adjustable chain fastener for waist and in various sizes to suit your needs.

Send coupon for sample and full information

MANUFACTURED BY
DEFIANCE WELDING COMPANY, DEFIANCE, O.

Sales Department
THE BAILEY-DRAKE COMPANY, Inc.
1118 S. MICHIGAN AVE., CHICAGO, ILL.

Coupon:
The Bailey-Drake Company, Inc.
1118 S. Michigan Ave., Chicago.
Gentlemen:
Send me sample Invincible Battery Apron, information and prices.

Name .....

Address .....

4 Minutes Steaming and Battery Is Ready for Dismantling

IBSCO
Battery Steamer



No need to remind you of the time and work wasted with the hot chisel or the hot water method of opening a battery.

The IBSCO Steamer does the work automatically in four minutes.

One, two, or all the cells can be removed, using the "Isbco," just as you prefer with no chance of breaking the jars or injuring the plates. Equally useful for dismantling the battery, heating jars for assembly or removing broken jars.

Does in four minutes what otherwise takes 40.

Lighting the burner is the only work involved. Heats steam from cold water in 8 minutes. Kept at steaming point all the time at small consumption of fuel.

Special still connected with steamer supplies from four to six gallons of pure distilled water daily at no additional cost.

"IBSCO" equipment adapted for use anywhere.

You can use the "Ibsco" whether you have regular water pressure or not. Feed it by hand if you want to.

Write today for descriptive literature and prices of the "Ibsco" Battery Steam

USE COUPON

SALES DEPARTMENT

THE BAILEY-DRAKE COMPANY, INC.

1118 S. Michigan Ave., Chicago, Ill.

COUPON:

THE BAILEY-DRAKE CO.,
1118 So. Michigan Ave., Chicago.

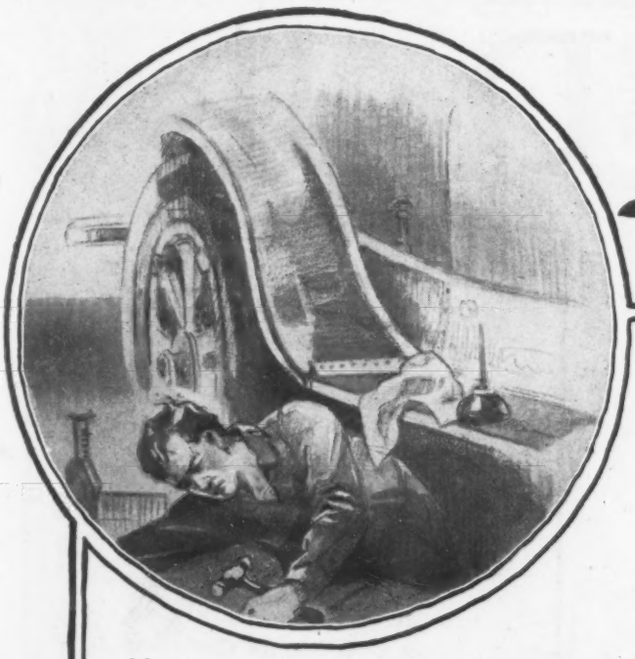
Gentlemen: Send us descriptive literature and prices of the Ibsco Battery Steamer.

Name .....

Address .....

Jobber's Name .....

IBSCO



Hold your men -get more done

I'm Through Unless the Boss Puts in a

KLEMME
ONE MAN
Auto Hoist and Crane

No one with an ounce of red blood in him likes to crawl under. An ear full of grease makes any fellow hopping mad. The best workmen are hunting up the shops that believe in **equipment.**

You can hold your men and save close to half your cost on overhauling motors with a Klemme. Most of the work is underneath. With a Klemme all the job is eas yto get at. Good light—tools all easy to reach — everything handy — meaning speed.

The pictures show what the Klemme does and how it does it. One man works it. Scientifically constructed; positively guaranteed to lift any size or weight of motor car; holds the car securely at any height.

Full particulars are given in our interesting booklet. Use the coupon.

Sales Department

THE BAILEY-DRAKE CO., Inc.

1118 S. Michigan Ave., Chicago, Ill.

COUPON:

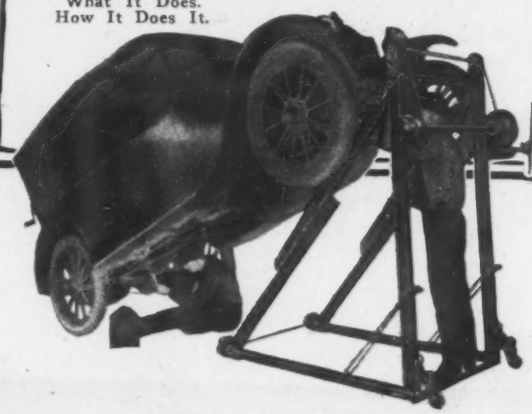
Bailey-Drake Co., Inc.,
1118 Michigan Ave., Chicago

Send me complete information of the Klemme Auto Hoist and Crane.

Name .....

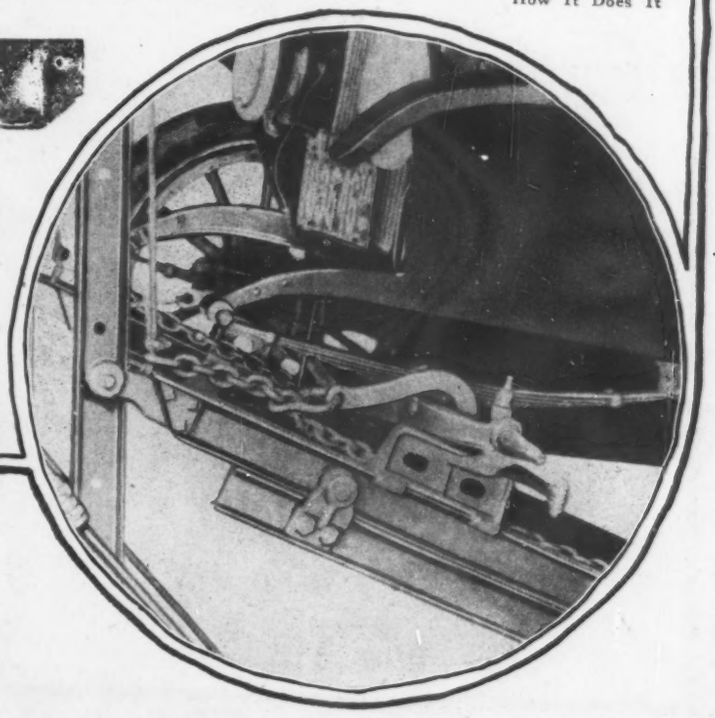
Address .....

What It Does.
How It Does It.





What It Does.
How It Does It



Jackson Drills and

THE rush job — the inaccessible piece of drilling—the painstaking job of auto body work—all demand the Jackson Pneumatic Drill. It's because it is light weight —has an abundance of power and an infinite variation of drilling speeds.

Its compact and sturdy construction—simple air motor and ease of operation make it an ideal tool for the garage and service station.

There is one size 0" to ½".



Valve Grinders

There is also a Jackson Pneumatic Valve Grinder for your particular valve grinding jobs. Unlike the usual grinder, it is impossible for the careless workman to "burn out" the motor by overloading. This powerful little air motor can be operated at the speed desired at all times. Light weight and exceptionally easy to handle.

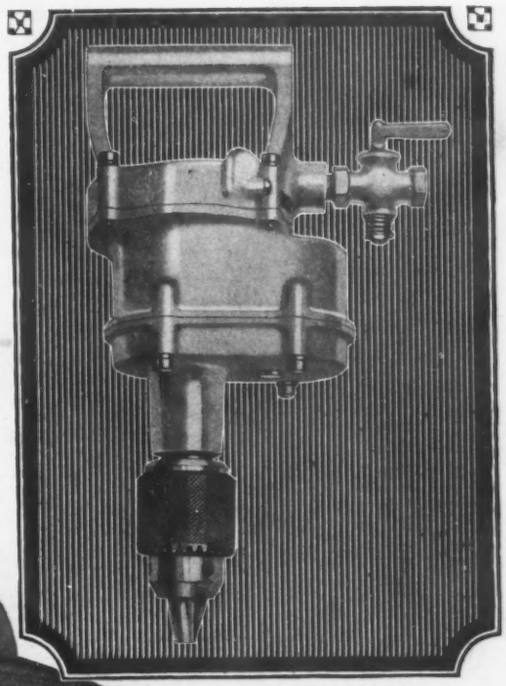
Write to our sales department for price and further information on these two time and money saving tools.

KALAMAZOO RAILWAY SUPPLY COMPANY

KALAMAZOO, MICHIGAN

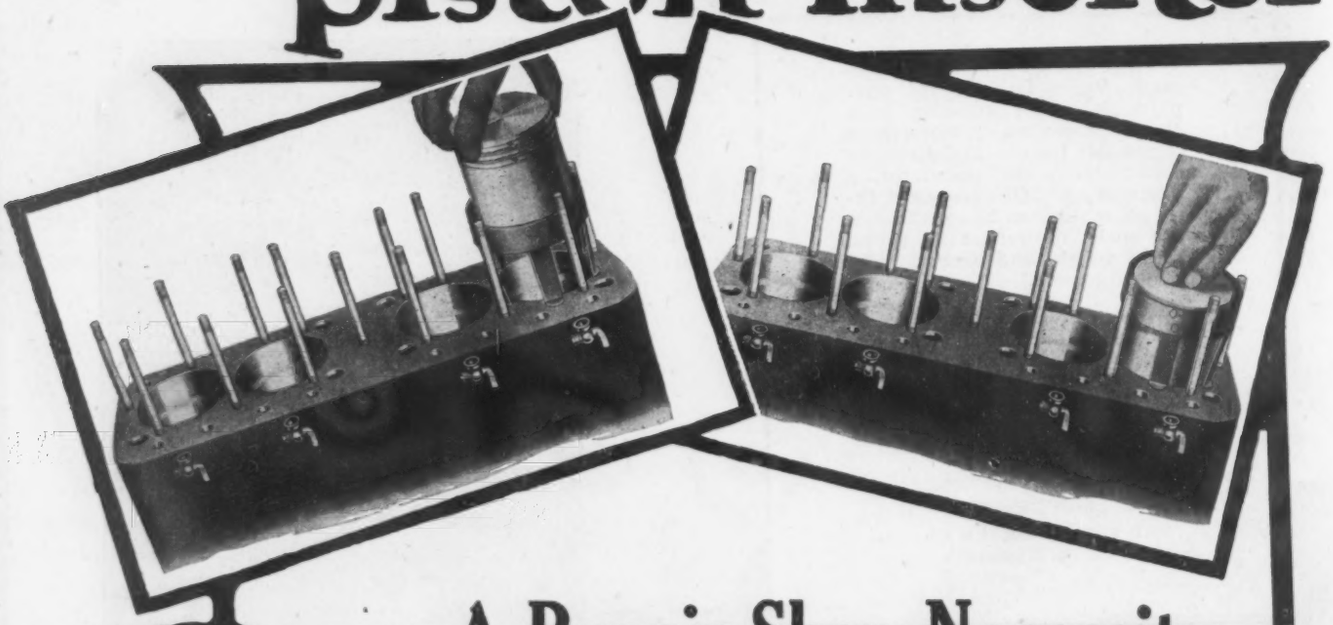
Sales Department

THE BAILEY DRAKE CO., Inc.
1120 So. Michigan Ave.
Chicago





UNIVERSAL piston inserter



A Repair Shop Necessity

The UNIVERSAL Piston Inserter is a handy little time and money saving device that every repairman should have in his shop. Merely place piston inserter on top of the cylinder, push piston through—and the job is done. The rings are automatically compressed by the tapered shape of the tool.

No mechanic can fail to recognize the value of this tool. On Ford engine jobs alone the time of inserting pistons is reduced to a small fraction of the time required by the old method.

Repairmen: Order this tool at once. Made for any bore. State size when ordering, or just say "For Fords." Send the attached coupon.

This is but one of many time saving devices we will soon be manufacturing for you.



$1.50 EACH



For Fords

G. C. MONCKMEIER

TIPTON, IOWA

G. C. MONCKMEIER
Tipton, Iowa

Send me ..... Universal Piston Inserters ..... following sizes:

For Fords ..... For ..... inch bore ..... For ..... inch bore .....

For ..... inch bore ..... For ..... inch bore ..... For ..... inch bore ..... For ..... inch bore .....

Name .....

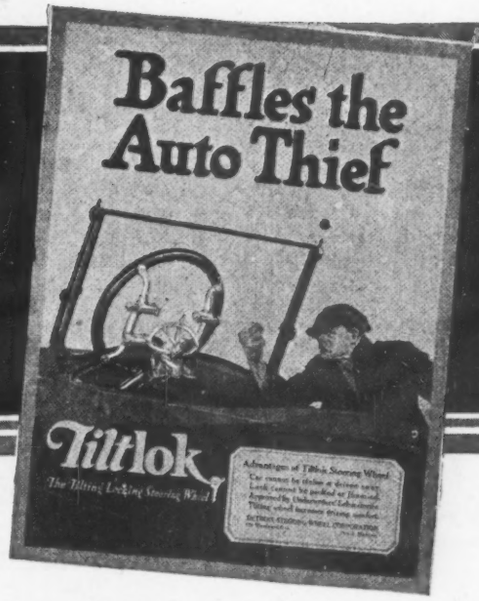
Address .....

City ..... State .....

My Jobber's Name and Address Are

.....

A splendid sales opportunity



Here is your chance to take on one of the most successful auto accessories of the year.

The Tiltlok Steering Wheel is a combination burglar proof lock and steering wheel. It provides two things that every car driver desires—absolute protection against theft and greater driving comfort.

To lock his car the driver simply turns key in the yale lock and wheel becomes free on the steering post—of course it is impossible for a thief to drive the car with this free wheel. The Tiltlok is fully approved by the Insurance Underwriters.

The tilting feature provides great personal comfort for the driver. Simply press a button and wheel tilts either up or down. Sales are especially easy to drivers of closed cars and to women motorists. Furnished in various styles for all makes of cars with a special model for Fords.

Write us today, or get in touch with our distributor in your territory and make quick arrangements for your stock of these fast selling, burglar proof wheels.

DETROIT STEERING WHEEL CORP.

979 WOODWARD AVENUE DETROIT, MICHIGAN

Distributors

TIMES SQUARE AUTO SUPPLY CO.
56th and Broadway, New York City.
TIMES SQUARE AUTO SUPPLY CO.
Buffalo, N. Y.
TIMES SQUARE AUTO SUPPLY CO.
Rochester, N. Y.
TIMES SQUARE AUTO SUPPLY CO.
Albany, N. Y.
TIMES SQUARE AUTO SUPPLY CO.
Newark, N. J.
L. G. TANDBERG
319 E. Monroe St., Springfield, Ill.
A. D. WALSTROM
2125 Locust St., St. Louis, Mo.

S. N. SUTTER
6527 Euclid Ave., Cleveland, Ohio
CHAS. S. SMITH, Inc.
1220 Race St., Philadelphia, Pa.
KUMMER & REYNOLDS
955 Woodward Ave., Detroit, Mich.
F. F. CUSHMAN
522 Pawtucket Ave., Pawtucket, R. I.
DETROIT STEERING WHEEL SALES CO.
157 Mason St., Milwaukee, Wis.
V. D. SCHAAR
619 West Second St., Flint, Mich.

C. E. NORMAN
304 S. Westlake Ave., Los Angeles, Calif.
R. L. HANRAHAN
1256 S. Michigan Ave., Chicago, Ill.
POSTAL & MILLER
755 Boylston St., Boston, Mass.



Tiltlok

The tilting locking steering wheel



Should Skid Chains "Clank" on a Rainy Day?

OR any other time? Of course not! But unfortunately, a careless motorist still makes himself conspicuous by the "clank, clank, clank" of his broken tire chains.

What's the remedy?—"The Missing Link."

With two twists a broken chain is repaired—a loose chain is made noiseless. And stronger than ever!

They're little tricks that every motorist knows and carries. A box of links to fit your chains can be had on a word from your dealer. The package tells how to use them and save chains, noise and money.

Priced at 50c per package of ten sets. Low enough insurance for any motorist to carry.

When "The Missing Link" Saves Your Temper

When you're stuck in the mud you'll find that one set makes as good a mud hook as a team of mules—when you hear the clank of a loose chain—when your chain breaks and drops—and a lot of other times.



Fair Notice to Dealers

When you hear the "clank" of a broken chain, it's a sure sign some wise motorist is coming to you for "The Missing Link." Lots of others will ask before him. Moral: Don't wait. Send now for details! Mention your jobber's name. J. P. Mentzer & Co., 2210 South Park Avenue, Chicago, Illinois.



Make Child's Play ANYWHERE of Load and Thrust

YEAR in and year out—by day and night, the lives of the Nation's rail travelers are safeguarded; its freight, express and mail protected by flanges on the wheels of giant locomotives and ponderous cars.

In BOWER ROLLER BEARINGS, the same flange principle is used to guide the rolls and resist end thrusts.

BOWER
ROLLER BEARING CO.
Detroit Michigan

BOWER SAVES POWER

Paterson SIX

A FINER MOTOR CAR VALUE

Quantity production means nothing in the Paterson organization. Great volume is not possible in conjunction with the fine ideals that are implanted in the minds of our craftsmen.

For the W. A. Paterson Company has set the high quality standard in body building many years before the motor car was born in the brains of the industry's pioneers.

We build cars in accordance with that standard—and the completed vehicles justify our organization's rugged pride of workmanship.

Long, smooth, power-suggesting lines distinguish the peculiarly Paterson body.

The choice of four beautiful color finishes permits of the individual buyer's self-expression at little extra cost.

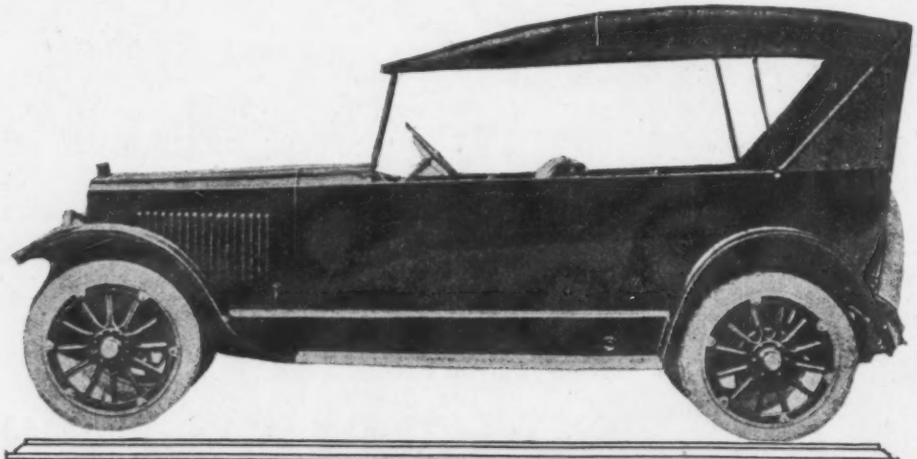
The standard specifications, every unit approved by engineering science and years of use, bespeak a mechanism that inspires a confidence in the Paterson Six which has never been shaken by improper or inadequate performance.

Engineering science, craftsmanship, beauty of line and color, upstanding utility, durability in regular use—these make a composite which justifies us in characterizing the Paterson Six as a finer motor car value.

Substantial distributors are invited to correspond with us.

Price $1695

W. A. Paterson Co., Flint, Mich.



The G & K LINK V BELT ASSURES NORMAL TEMPERATURE



NO SLIP

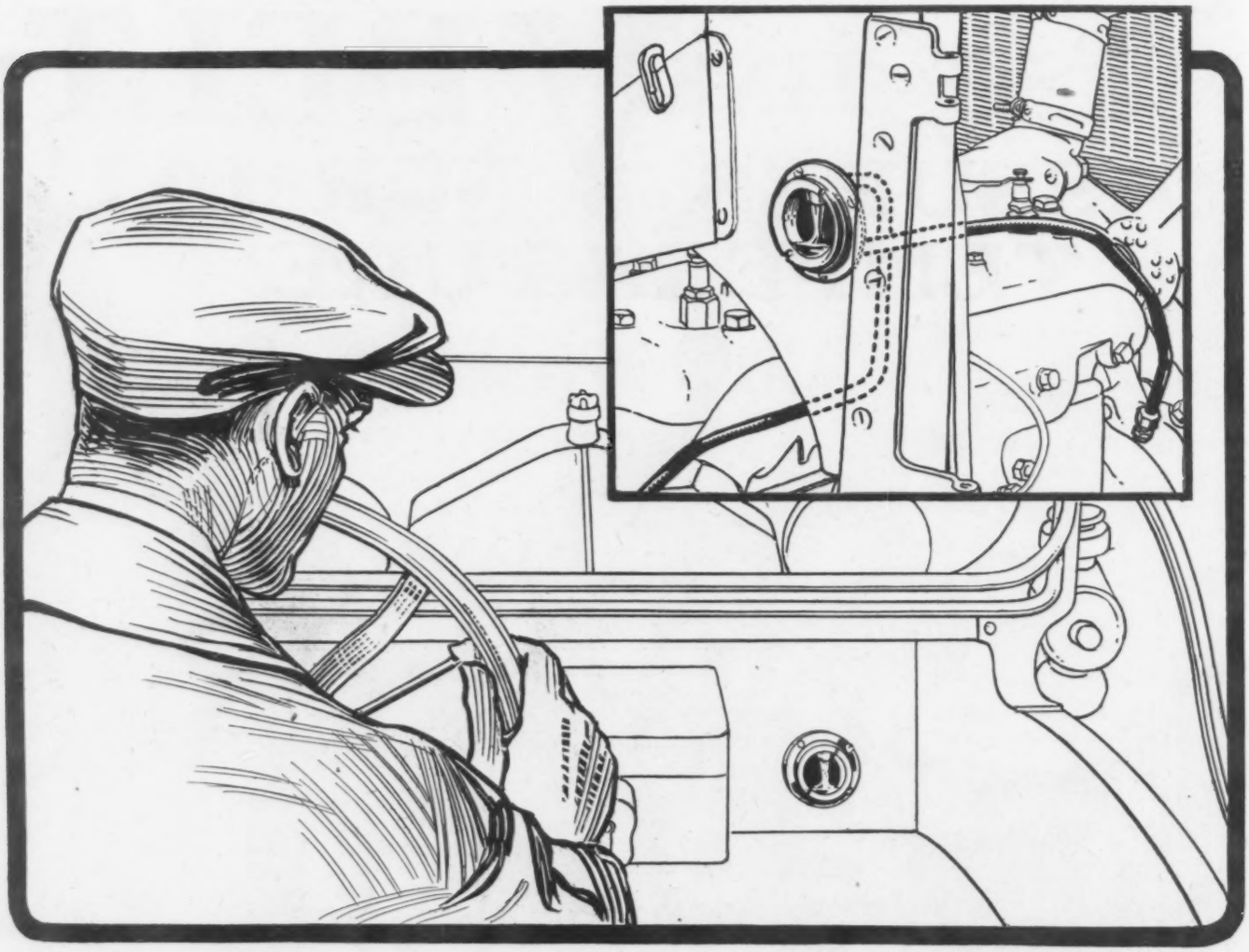
The G & K Link "V" Fan Belt makes the fan spin—and it keeps it spinning. There are two reasons for this: First, leather has a very high coefficient of friction, possibly the highest of any material. Second, the leather or outside links of the G & K Link "V" Fan Belt are trimmed to fit the groove of the fan. As the fan revolves, the Link "V" "seats" and grips the sides of the groove with a positive grip.

Write for descriptive literature.

The Graton & Knight Mfg. Co.

Automotive Equipment Division,

Worcester, Mass.



The Watchman On Your Dash

Eliminates the possibility of burned-out bearings and scored cylinders. It warns you when the oil is not circulating, or when the oil level is low.

In addition, the ZIM DASH OIL FEED is a positive, independent forced feed lubricating system.

The ZIM DASH OIL FEED reduces repairs. It saves time and the nuisance of under-the-car inspection. It saves fuel by insuring proper lubrication always.

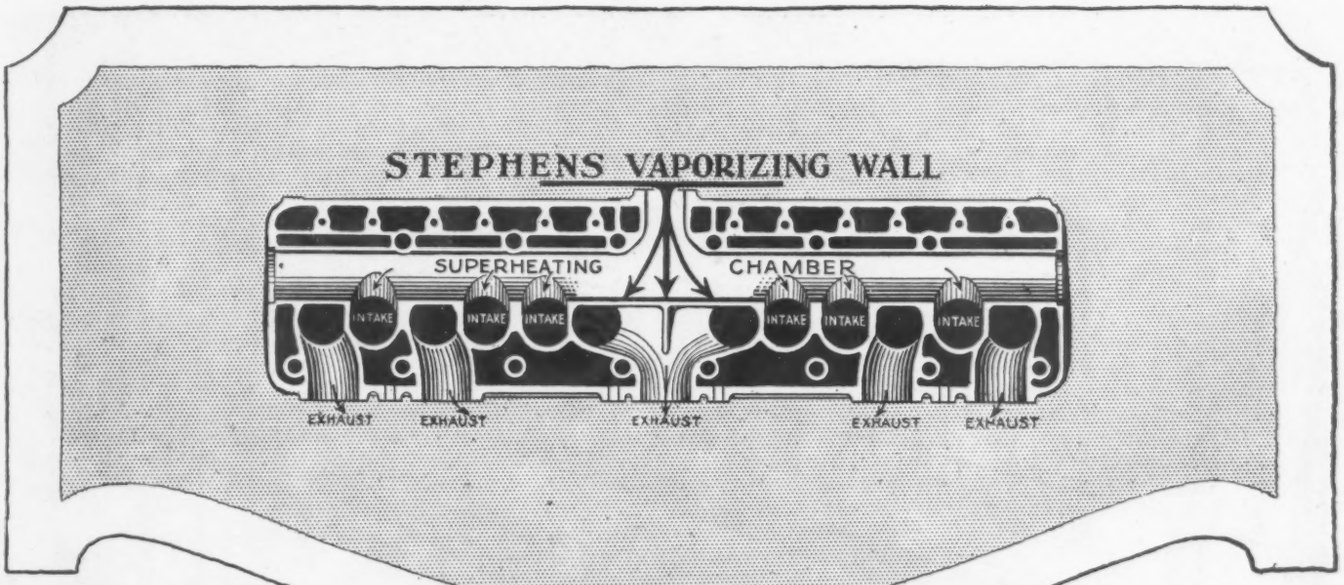
Adapted to every style of Ford car. Two types: For Dash or Instrument Board Installation.

Dealers are making money out of the ZIM DASH OIL FEED. They are also making satisfied customers.

Write for the Zim proposition.

ZIM ACCESSORIES CO., Room M, 208 N. Wabash Avenue, Chicago, Illinois

Zim Dash Sight-Feed Oil System for Fords



STEPHENS

Salient Six

A Greater Economic Value
A More Economical Service

The Stephens vaporizing wall and superheating chamber is the greatest boon ever conferred upon motor car owners.

Its full economic value can only be measured by results.

It makes the Stephens engine the most powerful and most economical for its size in passenger automobiles.

Rated at 25.3 H.P., the Stephens Perfected Overhead-Valve Engine develops 57.

Because of the Stephens Vaporizing Wall and Superheating Chamber, the Stephens Engine spins a single cup of gasoline into a thread of service, more than a mile in length.

THE STEPHENS VAPORIZING WALL AND SUPERHEATING CHAMBER

Fuel from the carburetor is thrown against the hot vaporizing wall, where it completely vaporizes, is dried and heated to a correct temperature.

It is maintained in this uniform state in the superheated chamber until drawn through the large valves into the cylinder.

Gas so prepared ignites quicker, explodes faster and burns completely before the valves open for discharge. It wastes no fuel, so it wastes no power.

This vast reserve power makes the Stephens a master all-around road performer;

—it combines speed, endurance, flexibility, hill-climbing ability and quietness at their maximum;

—it is no respecter of the grade of gasoline you put into the gasoline tank. The Stephens engine burns the lowest grades of gasoline without lessened performance.

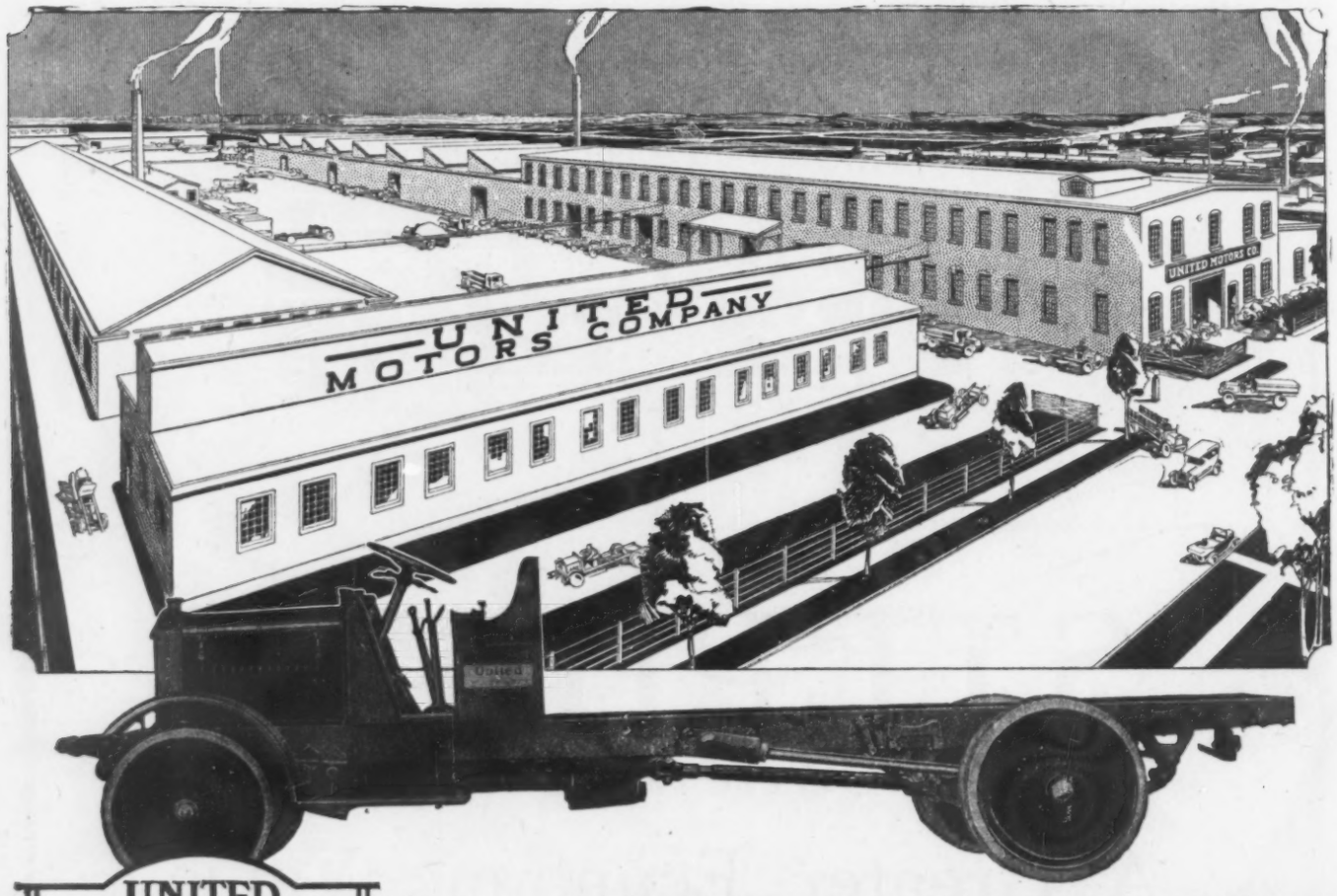
All this brings a greater saving and service to Stephens, the Salient Six, owners.

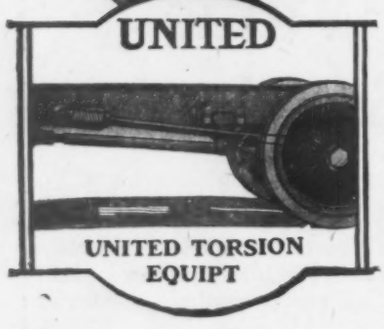
All this makes for a greater value of a Stephens Dealership.

STEPHENS MOTOR WORKS
MOLINE PLOW COMPANY

Sales Office: Moline, Ill. Factories: Freeport, Ill.

A GREATER VALUE STEPHENS A GREATER SERVICE





UNITED TORSION ROD

The torsion rod regulates the shock and weight on the springs and axle and is typical of the thought and care which has made this the wonder of truckdom.

The engine in this truck is the Buda. Stromberg carburetor, Brown-Lipe transmission, Clark internal gear axle, Eisemann magneto, Simplex governor and Ross steering gear.

A TRUCK WITHOUT A PEER

built by an old established, well financed company able to make prompt, satisfactory deliveries.

Few trucks compare with the United in power and performance. The quality of this truck is apparent and easily demonstrated. Its many exclusive features reflect careful, experienced construction.

You will find the unquestioned value of United motor trucks will swing the solid substantial truck buyer. With a size for every type of haulage, 1½, 2½, 3½ and 5-ton models, the United dealer is able to easily meet today's requirements.

In all matters of service we are known as standing solidly behind the local dealer and help him retain his customers' good will by prompt and able assistance.

A GOLDEN OPPORTUNITY FOR LIVE DEALERS

The United still has an opening for a few responsible dealers who have the financial backing, the pep and the experience to properly represent this company. To this type of man a selling franchise is available which will prove a most profitable connection.

UNITED MOTORS COMPANY

GRAND RAPIDS, MICHIGAN

UNITED TRUCKS

DETROIT

The Auto Center is the Logical Place To LEARN AUTO AND TRACTOR BUSINESS



Training for Head and Hand

Detroit, with more than 180 auto accessory factories, is indeed the *Heart of the Automobile Industry*. No other city offers such advantages to the student who would know the Auto, Truck and Tractor business thoroughly. Of all the automobiles manufactured today, 71 per cent are made in Detroit. Think of that! —and these same manufacturers heartily endorse our school and furnish us with their latest chassis.

Earn $100 to $400 Monthly

Trained men are always needed and can get the big, high salaried jobs. M. S. A. S. graduates are in demand in Detroit and throughout the country. There are thousands of locations for garages and the factories help find these locations. Service stations are after our graduates to fill positions as managers, foremen, etc., at big salaries.

Auto owners prefer to put their cars in competent mechanics' hands and our graduates have no trouble getting business and holding it. There were 6,353,233 cars and trucks licensed in the United States up to July 1, 1919. That astounding list has been added to every day since. The number is now well over seven million and several million more will be made during the coming year. Our graduates who are in business make $5,000 to $10,000 and more yearly. It is the M. S. A. S. training that makes this possible.

Complete Tractor Course Included

You are also given complete instruction on the care and operation of Farm Tractors as a part of our regular Auto Course. The constantly increasing use of tractors has created a big demand for trained tractor men. Manufacturers have placed machines with us for the purpose of giving our students the benefit of practical instruction along these lines.

TRAIN IN DETROIT AND GO BACK TO THE FARM

Hundreds of our students are coming to Detroit and taking our course and returning to the farm, thoroughly competent to care for their tractors, trucks and autos as well as those of their neighbors.

Brazing and Welding and Tire Repairing

These two subjects are taught in separate courses. Hundreds of students take them with the Complete Auto Course. Others take them separately. Competent men are in big demand in both fields. Brazers and welders are needed in every field—Tire Repair men are always in big demand.



Money-Back Guarantee

We guarantee to qualify you for a position as chauffeur, repair man, demonstrator, auto electrician, garage man, automobile dealer or tractor mechanic and operator, paying $100 to $400 monthly, or refund your money.

MAXWELL MOTOR COMPANY
INCORPORATED
MANUFACTURERS OF AUTOMOBILES
DETROIT, MICH.

Mr. James Williams,
20 Lincoln St., Gloversville, N. Y.

Dear Sir:—Your letter of February 23, making inquiry regarding the Michigan State Auto School received.

Their methods of instruction, lectures and theories are 100% perfect. With all of their equipment and with the practical work that students are able to get in their own organization, I really believe that mechanics throughout the country are missing one great opportunity if they do not take advantage of their couse.

I most heartily endorse the course.

Very truly yours,
MAXWELL MOTOR COMPANY, Inc.

HUDSON MOTOR CAR COMPANY
Detroit, Mich., U. S. A.

The Michigan State Auto School, in our opinion, is the finest institution of its kind in the country. In fact, we endorse its method of instruction.

We have recommended a great many students to them and the results were satisfactory.

The Michigan State Auto School ranks highest in the standard of schools. Its equipment and personnel is second to none.

You will make no mistake by entering for a course.

Yours faithfully,
(Signed) F. W. Moisselle, Service Department.

Graduates Pass State and City Examinations

Graduates of the M. S. A. S. have no difficulty in passing required examinations for automobile mechanics, chauffeurs, etc. No matter where you go, our training will enable you to handle the work easily and quickly.

FREE—Big 176 Page Catalog

Also latest copy of "Auto School News." They tell about courses—show hundreds of pictures of equipment—give letters from big auto factories and graduates. Write now for them, they are absolutely FREE—or better still, write us when to expect you and jump on a train and come to Detroit as hundreds of others have done. Come—Start training at once. ACT NOW!

Complete Training in Auto Electrics

Our course in Auto Electrics is very complete. Students are taught all about the different electric currents. Every standard electric equipment for autos, trucks and tractors is set up in actual operation in the class rooms for the students to work on. Students are taught thoroughly how to quickly and easily locate electrical troubles. This work is very interesting. Hundreds of our graduates are filling high-salaried positions in electrical service stations and we have demands for more men than we can supply.

Students From All Over the World

Men are coming to our school from every quarter of the globe, recognizing it as the WORLD'S TRAINING PLACE for auto, truck and tractor mechanics because of our CLOSE FACTORY CO-OPERATION.

START ANY TIME—ENTER CLASSES ANY DAY.

Our school is open the year 'round. Enter the classes any day. You can get started the same day you arrive. Our welfare department will assist you in finding a good room and splendid meals.

Not a One-Man School



This school is founded on the best, newest and most practical principles in the Auto Truck and Tractor business. Our course is built on the widest and closest co-operation of manufacturers, garages, service stations and owners. It is not one man's ideas, but the combined ideas of the biggest and most successful men in each field.

MICHIGAN STATE AUTO SCHOOL

"Most Progressive Auto School in America"—"In the Heart of the Auto Industry"

7601 Auto Building
687-89-91 Woodward Ave. **Detroit, Mich., U.S.A.**

Brookins

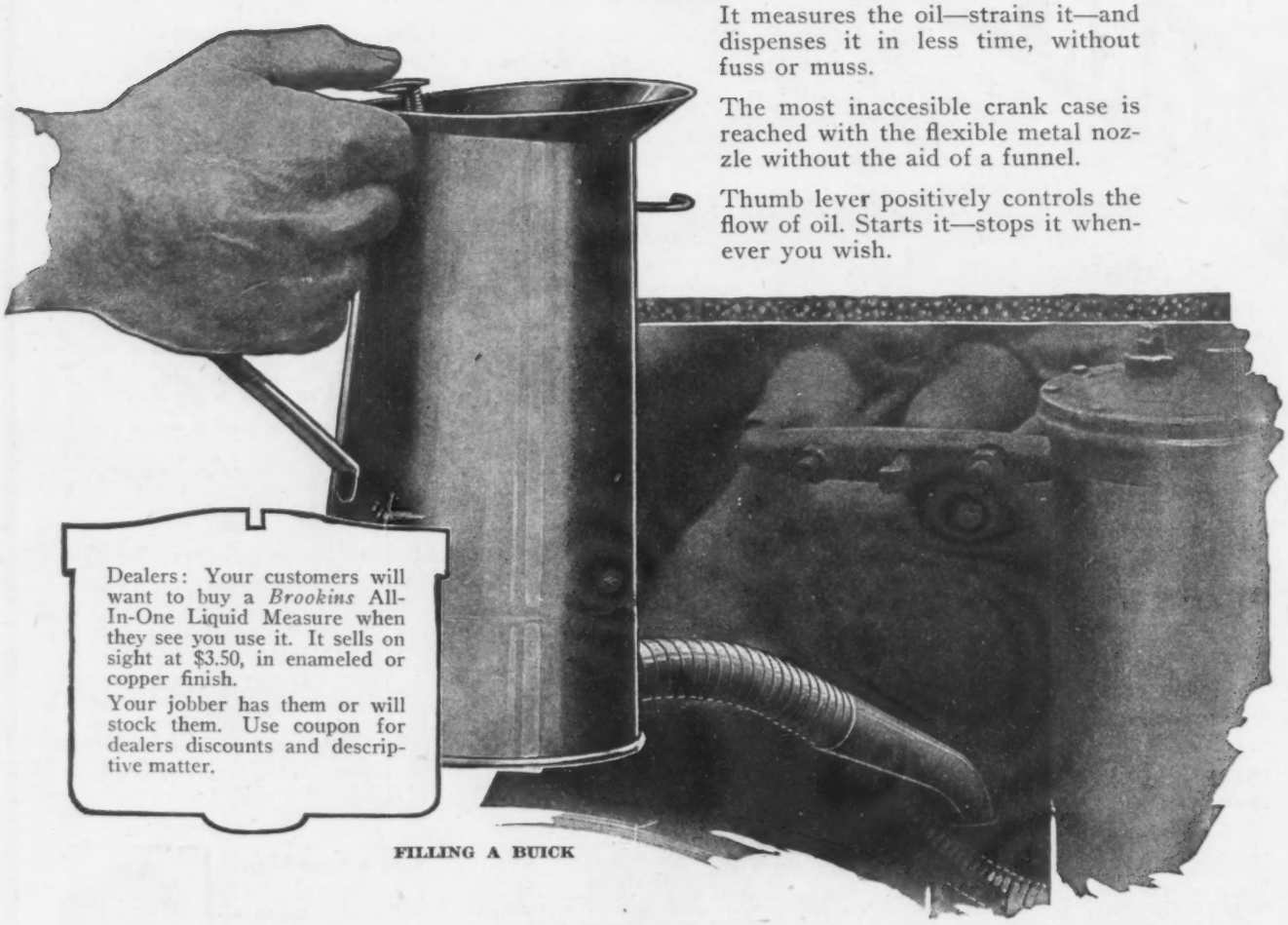
ALL-IN-ONE LIQUID MEASURE

IT'S A PLEASURE to sell oil when you use a *Brookins* All-In-One Liquid Measure.

It measures the oil—strains it—and dispenses it in less time, without fuss or muss.

The most inaccesible crank case is reached with the flexible metal nozzle without the aid of a funnel.

Thumb lever positively controls the flow of oil. Starts it—stops it whenever you wish.



FILLING A BUICK

Dealers: Your customers will want to buy a *Brookins* All-In-One Liquid Measure when they see you use it. It sells on sight at $3.50, in enameled or copper finish.

Your jobber has them or will stock them. Use coupon for dealers discounts and descriptive matter.



The Brookins Manufacturing Company - - - Dayton, Ohio

Staff Brothers Co., New York City—Eastern and Southern Representatives
John M. Stockfisch, Chicago, Ill.—Central Representative

Brookins Manufacturing Co., Dayton, Ohio

Gentlemen:—Please send me descriptive matter and dealers discounts on *Brookins* All-In-One Liquid Measure.

Name..... Address.....

Your Jobbers

Name..... Address.....

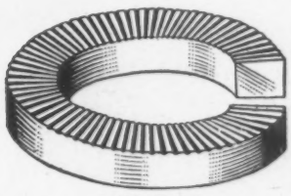
Before You Put On the Nut—



Cut Out Those "Rattles!"

Nearly all "rattles" on a car are caused by just one thing—loosened nuts. And that trouble is so easily avoided that no one need be bothered with it. Simply follow this rule: Whenever you're about to put on or tighten a nut, *first insert a*

NEVER SLIP



LOCK WASHER

Neverslip Lock Washers are easily identified, because they have a *corrugated* gripping surface. This feature is patented. It is *exclusive* to the Neverslip Lock Washers. And by actual comparative test, it has been proved to give them

60% Greater Gripping Power



Look for this display rack of Neverslip Lock Washers in all Auto Supply Stores of the better class.

A complete, technical record of the test, as made by the Curtiss Aeroplane Co., will be mailed free to anyone interested.

Neverslip Lock Washers are made of the highest grade, spring-tempered steel. Your dealer has them—or can get them for you promptly.

Look for the attractive metal cabinet illustrated at the left—at automobile supply and hardware stores everywhere!

If your dealer can't suuply you write us direct, giving his name.



Here is the user's box that contains 530 Neverslip Lock Washers in all assorted sizes. It's a handy box to have with you — to use whenever a nut gets loose.

DEALERS: Write for Display Cabinet No. 10.

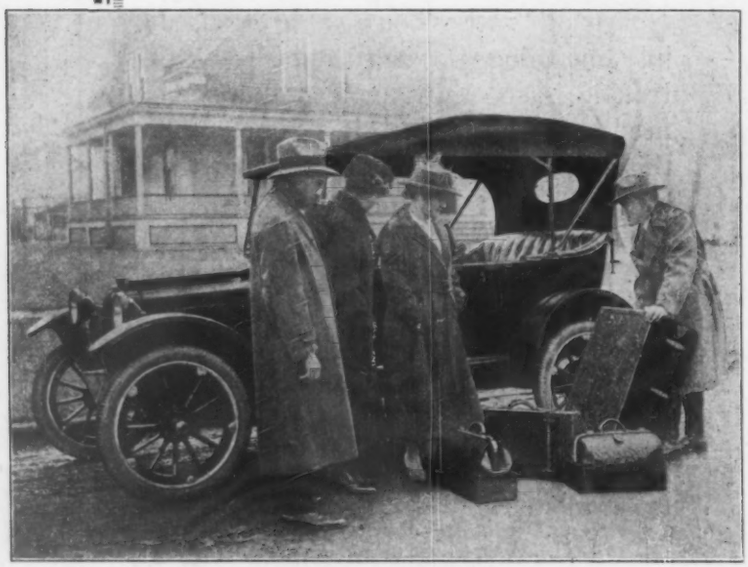
NATIONAL UMBRELLA FRAME CO.

PHILADELPHIA, PA.

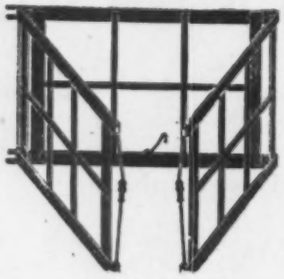
DEALERS: Write for assortment No. 5.

Ever Try to Ride in Comfort with a Lot of Excess Luggage

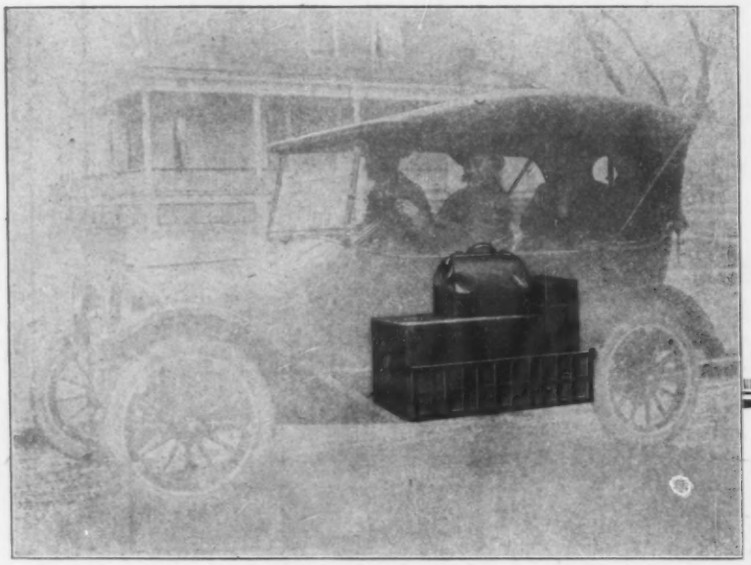
RUST'S DETACHABLE LUGGAGE CARRIER



TROUBLE



Patented



ANSWER

will go on any car. Lasts a life time. Takes all the running board of a Ford, Chevrolet, Maxwell and Dodge car. Doors of a Ford will open above it. Put up in separate lock end cartons. Ideal for Farmers, Tourists, Campers, Picnickers, Traveling Salesmen, Grocery Delivery, Liverymen, in fact, any one with an automobile of any kind. It's all above the running board, no clamps to take a little bite at edge of board and work loose. Extra strong and rigid.

Mr. Dealer—it's a live seller. Most practical carrier made. Sold through leading jobbers and dealers. Write us direct if your jobber don't have them—current list price $5.00.

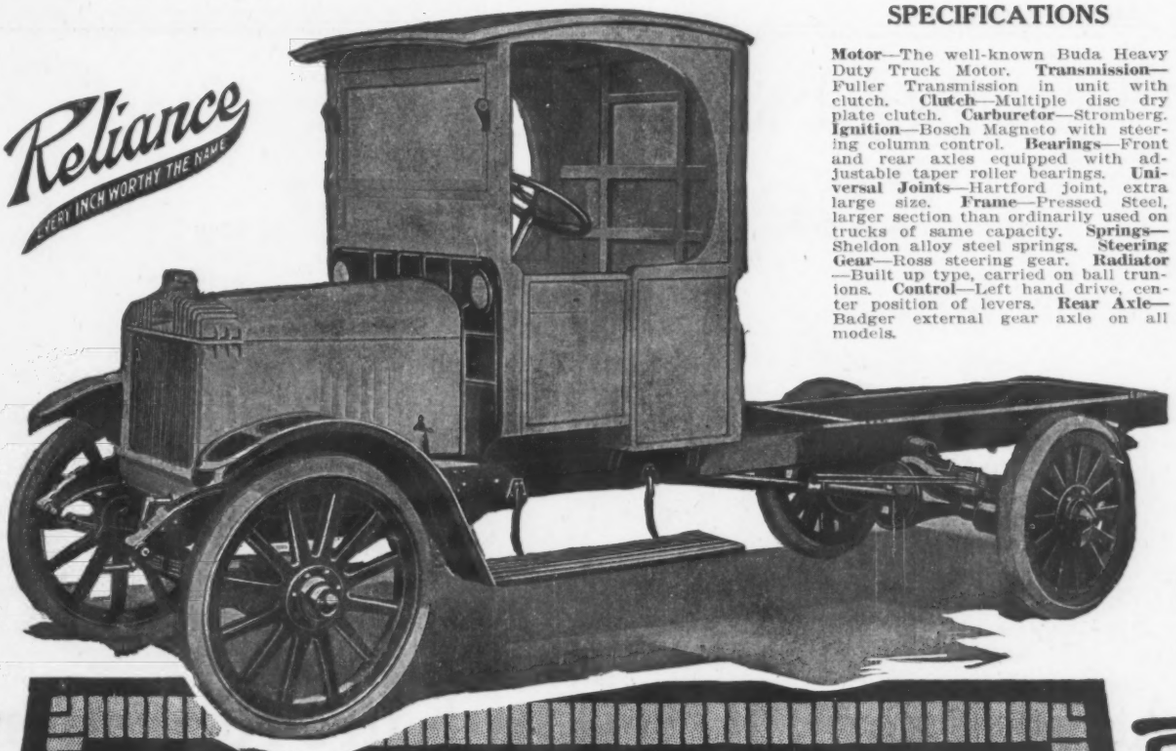
Rust Manufacturing Company

Marshalltown, Iowa
So. 3rd Ave.

Minneapolis, Minn.
1201 4th St. So.

Reliance

EVERY INCH WORTHY THE NAME



SPECIFICATIONS

Motor—The well-known Buda Heavy Duty Truck Motor. **Transmission**—Fuller Transmission in unit with clutch. **Clutch**—Multiple disc dry plate clutch. **Carburetor**—Stromberg. **Ignition**—Bosch Magneto with steering column control. **Bearings**—Front and rear axles equipped with adjustable taper roller bearings. **Universal Joints**—Hartford joint, extra large size. **Frame**—Pressed Steel, larger section than ordinarily used on trucks of same capacity. **Springs**—Sheldon alloy steel springs. **Steering Gear**—Ross steering gear. **Radiator**—Built up type, carried on ball trunions. **Control**—Left hand drive, center position of levers. **Rear Axle**—Badger external gear axle on all models.

Proven By the Years

The Reliance is a sturdy, reliable truck—reliable at all times.

It is unnecessary to relate the story of Reliance reputation for an honest, reliable truck and fair dealing with dealers. The story has been told by the years. During the ten years Reliance trucks have been built, many improvements have been made in motor trucks. Reliance has kept pace with all these and led the field in many instances.

The Badger External Gear Axle which is used on all models, is but one example of this leadership.

We are broadening our sales organization and want dealers that are like the Reliance Truck—sturdy and reliable—*always.*

RELIANCE MOTOR TRUCK CO.

APPLETON WISCONSIN



The Badger External Gear Axle is usec on all Models

Guaranteed Retreads Are Now Possible

The Old Way



Advantages of the Dri-Kure Retreder

The figure above shows the result of curing in the ordinary mold. As shown on the right, the pressure is applied clear to the heated end of the mold. The heat causes the stock to flow from under the pressure on to the end of the mold, resulting in a thinner tread, and a bulge or mold mark at the laps.

Sometimes a shorter pressure medium is used which does not carry pressure clear to the ends of the molds. As shown at the left, this results in porous or spongy spots due to heat without pressure. These porous laps, although they may not be apparent on the surface, wear out quickly in service.

THE DRI-KURE RETREDER
ELIMINATES ALL OF THESE DEFECTS

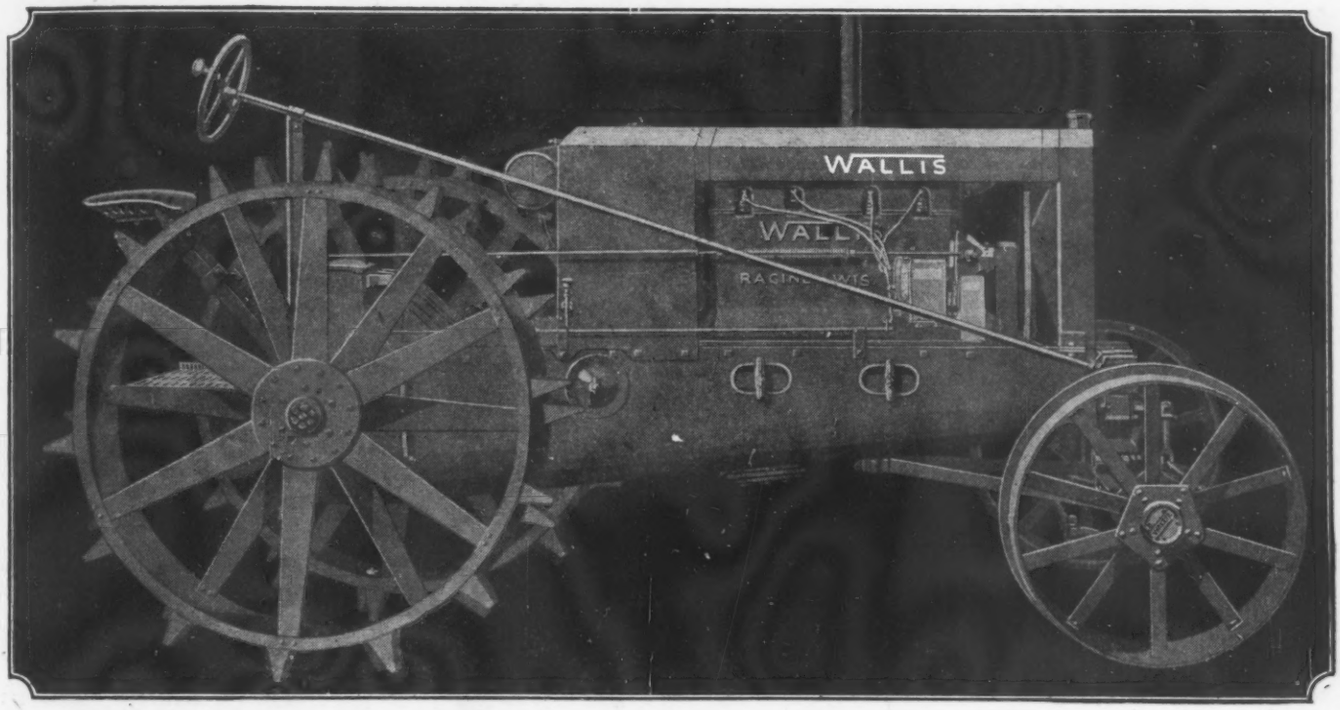
Figure 2 shows the Dri-Kure Retreder method. Note that the non-heat conducting wood-end blocks (our exclusive feature, patent applied for), enable you to bring pressure to bear beyond the ends of the mold where there is no heat, preventing the stock from flowing out from under the molds, eliminating thin spots and mold marks, and producing a smooth, well-cured lap and a perfect job both in appearance and wearing qualities all the way around the tire.

The Dri-Kure Retreder turns out a finished job. No "spotting-in" or finishing is necessary.



WESTERN VULCANIZER MFG. COMPANY

Manufacturers of Dri-Kure Retreders, Sectional Molds, Buffing Machines and Other Vulcanizing Equipment
DEPT. M, 150 N. DESPLAINES ST. CHICAGO



Wallis Will Be Center Of Interest at Big Tractor Shows

Everything indicates that the Wallis—"America's Foremost Tractor,"—is to be a center of tremendous interest at the National Tractor Show at Kansas City, Minneapolis, and at the other big tractor shows.

Tractor buyers and tractor prospects—influenced by impressive Wallis advertising—and by the enthusiastic recommendation of users—are looking forward with keen anticipation to a personal inspection of the Wallis.

Visiting dealers with an eye to a permanent profitable tractor business, expect to find a complete answer to their demands in the Wallis, America's Foremost Tractor.

Every question that can be asked about the Wallis will be answered to your complete satisfaction if you will call at the Wallis booth at any of the big shows.

Representatives of the company will be on hand to explain anything you wish in connection with the tractor itself, or the Wallis proposition to dealers.

J. I. CASE PLOW WORKS COMPANY **Racine Wis., U. S. A.**

Branches and Distributing H ouses in All Principal Cities.

NOTICE—We want the public to know that the WALLIS TRACTOR is made by the J. I. CASE PLOW WORKS COMPANY of Racine, Wisconsin, and is NOT the product of any other company with "J. I. CASE" as part of its corporate name.

WALLIS

America's Foremost Tractor

NOTICE—The Wallis Tractor and J. I. Case Power Farming Implements will be exhibited at Kansas City, Minneapolis and other important Tractor Shows.

J-K LEVER PUMP



We can put the **Pressure up to 300 pounds** with the **J-K Lever Pump. Conclusion** —as it is extremely powerful, it is correspondingly easy to operate.

The Lever System we use on this pump is the reason for its being so powerful and easy to operate.

It is all Steel Built—

It is single acting—without a Stuffing box.

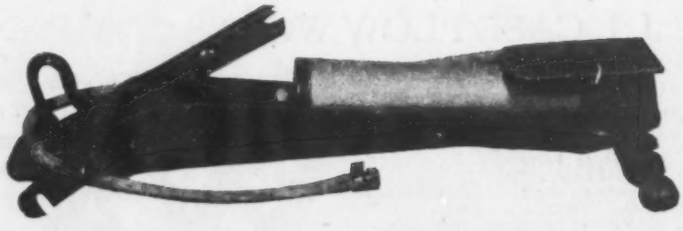
Strong — Durable— Reliable. We have a great many letters from satisfied users.

The J-K folds up for the tool box or under the seat.

Jobbers: Write for our proposition.

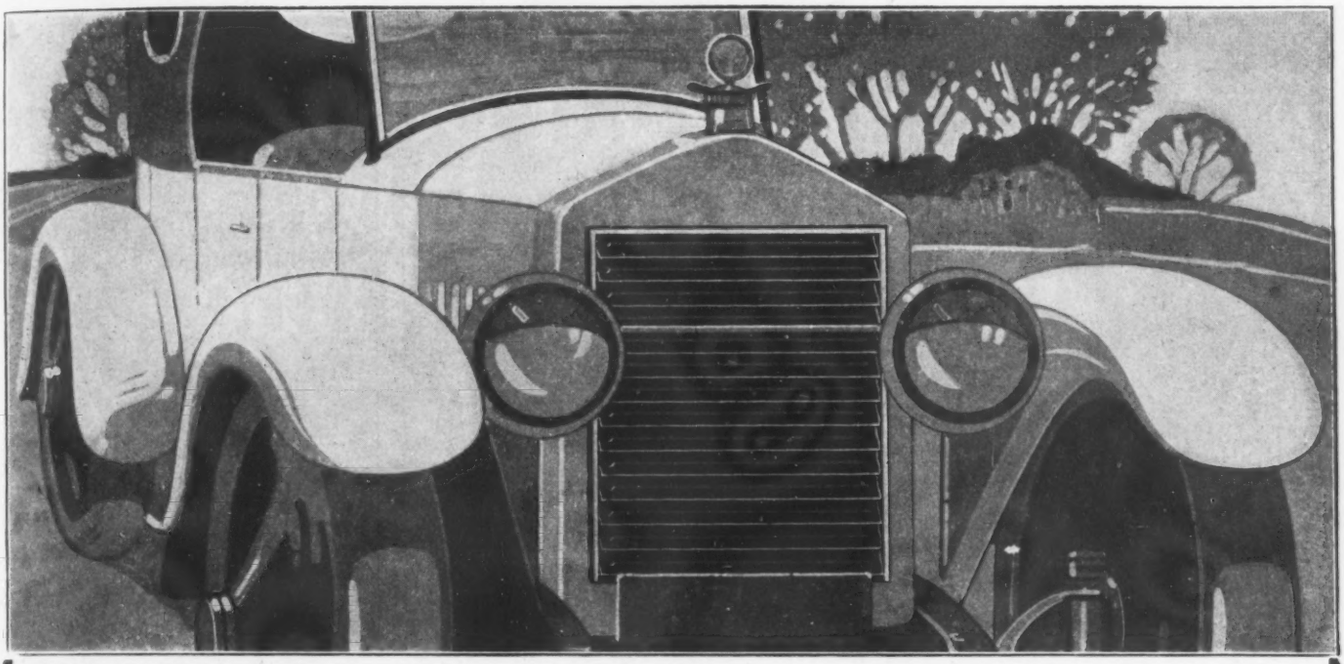
Dealers: If your jobber cannot supply you, write to us and give us his name. We will see that you are supplied.

Retail Price $5.00



JENSEN-KOHLERT MFG. CO.

ST. CHARLES, ILL.



Automobile Complete-ness

The UNIVERSAL is Made for the Following Cars:

Ford	1917 and later
Overland "4"	1920
Overland "90"	all models
Maxwell	1917-18-19
Maxwell	1920
Chevrolet	1917-18-19-20
Dodge	1915 and 16
Dodge	1917-18-19-20
Buick	all 1917 "D" models
Buick	all models "E" 1918, "H" 1919, "K" 1920
Oakland	1918-19-20
Saxon "6"	1917-18-19-20
Studebaker	Series "19" Little Six
Studebaker	Series "19" Big Six
Chalmers	35C, 1917-18-19-20
Chandler	1917-18-19-20
Hupmobile	1917-18-19-20
Nash	1917-18-19-20

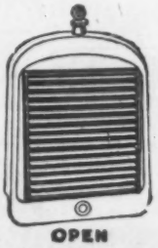
Other types being developed

The car of 1920 includes the radiator shutter. It is now a recognized necessity, and the automobile without it will be rare indeed in the very near future. Correct operating temperature of the motor must be maintained under all conditions and in all seasons if you are to get the maximum efficiency from your motor. The old method of driving with an unprotected radiator causes gas waste, motor inefficiency and shortens the life of your car.

UNIVERSAL RADIATOR SHUTTER

Fits snugly into your radiator shell and becomes a permanent part of your car. The method of anchoring the Universal Shutter under the shell provides for installation which does not impair the cooling efficiency of your radiator in the least. It can be regulated from the driving seat just as easily as you would turn on your lights or your ignition, and can be opened as much or as little as weather conditions necessitate. Every month in the year—every day in the month you will find it economy to use a Universal Radiator Shutter. It also adds distinctiveness and class to the appearance of your car.

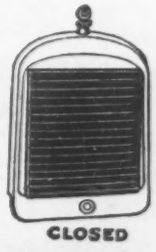
See your dealer today—he has a Universal that fits your car, if it is shown on the list here—or he can get it for you from his nearest jobber. Descriptive circular mailed on request.



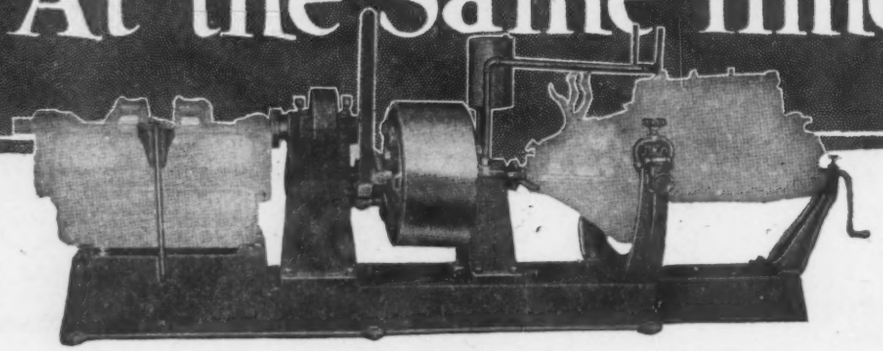
Auto Metal Parts Company

DEPT. OF SALES—624 MICHIGAN AVE. CHICAGO, ILL.

FACTORY—DES MOINES, IOWA



A Machine that Does Two Different Jobs At the Same Time



MILES

The Original Combination

Bearing Burning-In & Running-In Machine

This is the only machine that will burn-in either the Ford or Fordson motor and run-in and test a Ford motor at the same time. It is very compact and is a one man machine.

The asbestos faced cone clutch has been used for four years without any necessary change in design. It is positive in action and has only three working parts. It never requires any adjustments. It is built to withstand the severe strains to which it is subjected.

The Miles has a large capacity and will do the work of three ordinary machines.

It is the original combination bearing burning machine. It has an established reputation for being the best machine of its kind both in design and workmanship.

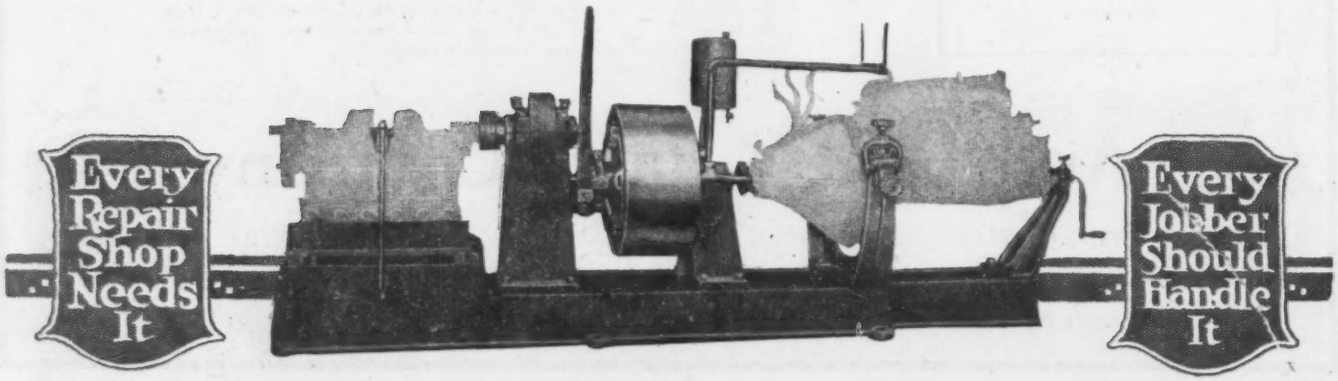
This is a machine every jobber should carry and every garage and repairman should use. Send for our catalog.

MILES MANUFACTURING CO.

NEWTON IOWA

Manufacturers of

Miles Cylinder Block Bench Plates
Miles Triple Gear Riveting Block
Miles Rear Axle Stand
Miles Standard Piston Vise
Miles Combination Bearing Burning-In Machines

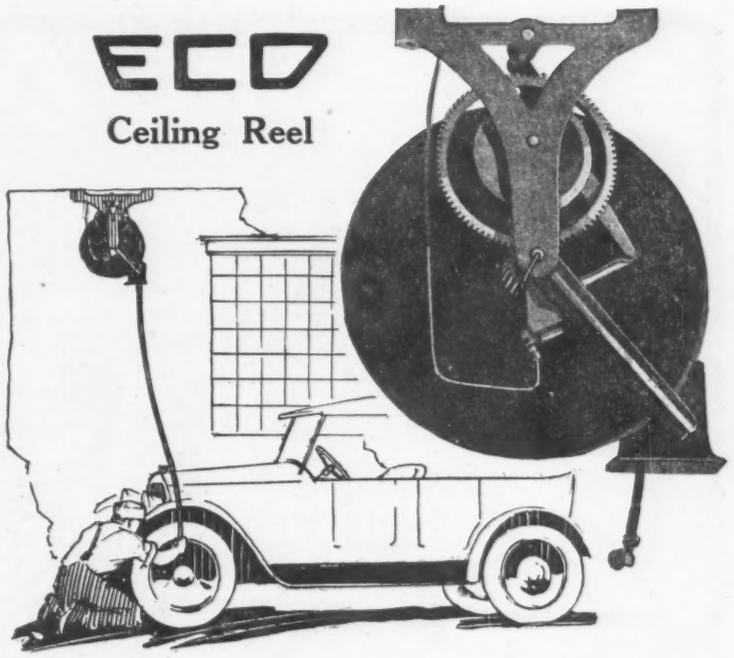


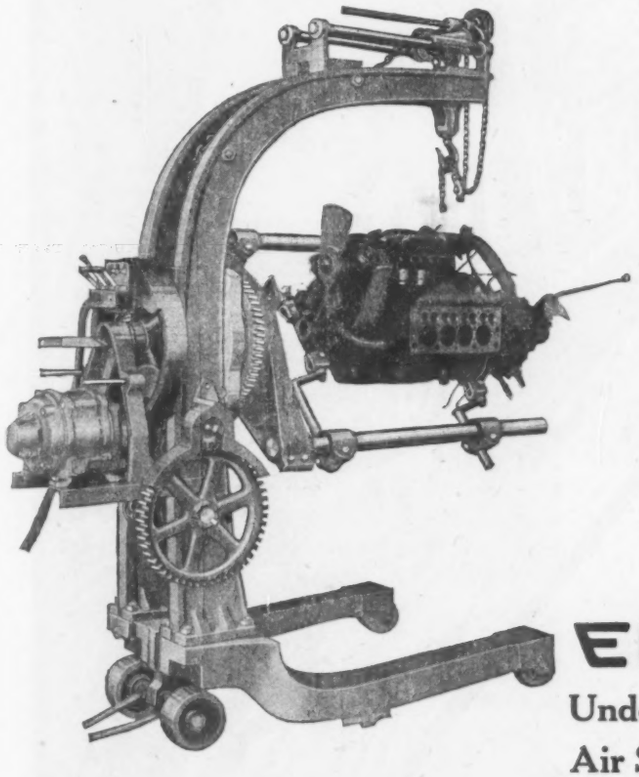
ECO TIME SAVERS

FOR THE GARAGE AND SERIVCE STATION

The ECO ceiling air station soon pays for itself in the saving of wear and tear on the air hose—and its convenience and out-of-the-way location make it ideal equipment for the modern garage. With one or more of these ECO stations in the garage, any car can be reached without moving the station. The most up-to-date form of air supply obtainable. Fifty feet of hose, automatic cut out, gear type construction.

ECO Ceiling Reel





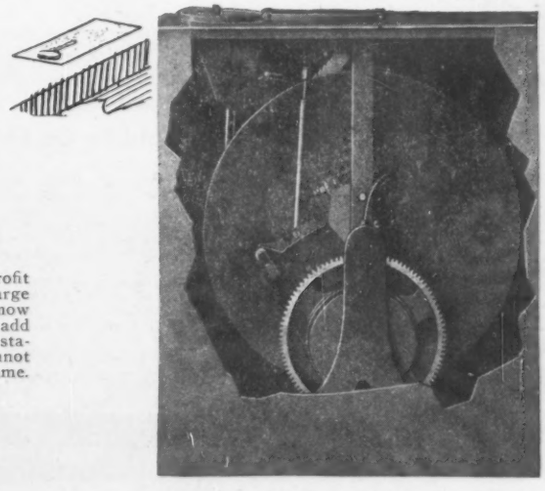
ECO UNIVERSAL

MOTOR HAULING MACHINE

This machine is used in three ways, each one of which is indispensable in the up-to-date garage or service station. The ECO Universal is a hoist, every-way engine stand and burning-in stand all in one. It can be used with every make of motor. The motor can be lifted out of the car with magneto, carburetor, etc., on, can be started up and run while in the stand and can be turned in any desired position . One man has taken out a big Buick "6" motor, put in a new crank shaft, run in the bearings, in 20 hours without any assistance whatever. The crane or hoist is made of steel, the engine stand is made of steel castings with cold roll bars, and the every-way attachments are made of steel castings. Weight of complete machine, 1600 lbs. In your shop, it will be among your most valuable equipment.



ECO Underwalk Air Station



ECO under sidewalk station is a self-contained unit furnished in either the pay or free type supplying air only. It contains a patented enclosed spring operated reel carrying air hose. An automatic cut off operates except when hose is pulled out. Weather proof and occupies no room above sidewalk. Prepayment type has coin controlled device which releases hose after coin is deposited.

The ECO Line Includes

All types of prepayment air and water stations, engine stands for Ford motors—Universal engine stands—hoists, hose reels, etc. Complete details of the entire line of garage time-savers will be sent you on request. Find out how you can install an ECO station and make our air service pay a subtsantial profit rather than remain a constant loss. A large number of garages and service stations now make their air service profitable and add patronage at the same time with ECO stations. Order from your jobber. If he cannot supply you, write us and give his name.

WESTERN MFG. CO.

OSKALOOSA, IOWA



Right Through!

The mud, snow or sand that makes the other car's wheels spin helplessly, has no terrors for the car equipped with a pair of

Syde Gripper
MUD, SNOW AND SAND HOOKS

"Side traction" is the secret of their efficiency. When road conditions offer no bottom traction the side protruding wings of the "Syde-Gripper" come to the rescue with almost unlimited side traction.

The Deeper They Sink, the Firmer They Grip

No need to pay $10.00 to be hauled out of a hole. It's cheaper to carry a $4.50 pair of "Syde-Grippers." They go on or off in a moment without trouble or tools. Perfect for all anti-skid purposes, but used in addition to chains by many who are wedded to the chain idea.

Make Even the Smallest Car a Giant of Strength in Mud, snow or sand, because it *moves right on*, while the more powerful car spins its wheels in futile (because misdirected) effort.

Power *alone* is useless—it must be combined with *traction* to give forward motion to the car and the *side-traction* of the "Syde-Gripper" wings, added to the *under grip* of the "Syde-Gripper" chains, gives the firm wheel hold that overcomes every obstacle.

Should Be On Or In Every Car

"Syde-Grippers" go on and off in an instant. Simply turn a winged nut. When not **on** your car, they should be **in** it, ready for emergency. Price, $4.50 per pair. Many dealers already handle them and will be glad to demonstrate. Other dealers should write for information, naming their jobber, and jobbers are invited to get our worth-while proposition. Sent prepaid upon receipt of price to localities where not represented, or descriptive matter mailed upon request.

BERSTED MANUFACTURING CO.,
763-771 Mather Street, Chicago, U. S. A.

The Bersted Double Row Ball Thrust Bearing.
For Ford and Chevrolet Cars.

Perfectly balanced, carries load on two rows of balls, keeps gears perfectly meshed, insures quiet running with least wear. Ask your dealer or send for circular.

KOMPAK
FOLDING
Luggage Carrier

The last word in simplicity and convenience. Takes all the luggage needed without crowding tonneau. On or off in an instant, without tools. Folds flat and stows under seat cushion. Ask your dealer or send for circular. Price $4.50.

The VULCAN

ONE HEAT—40 MINUTES To Retread a Complete Tire

The Vulcan is a new and greatly advanced type of flexible Tire Retreading Mold—thoroughly tested and proved—which eliminates two out of three heats—eliminates overlaps, and cures or vulcanizes tires under uniform air pressure (an exclusive Vulcan feature) while they are on the ordinary rim. Vulcans are time savers, labor savers. Vulcan Molds are made in four sizes and will handle all popular size tires from 30x3 to 37x5.

AN OPPORTUNITY FOR EVERY GARAGE OR TIRE REPAIR SHOP

Tire Retreading—handled with ease, speed and highly satisfactory results, will soon build up a business of great volume. Customers for whom you save practically 50% of their tire costs can't help selling the Vulcan Service to their friends. Vulcan Molds turn out a Rib Tread that is equal to 5000 or 6000 miles of service. The mileage depending upon the condition of the old tire.

We Teach You the Vulcanizing Business

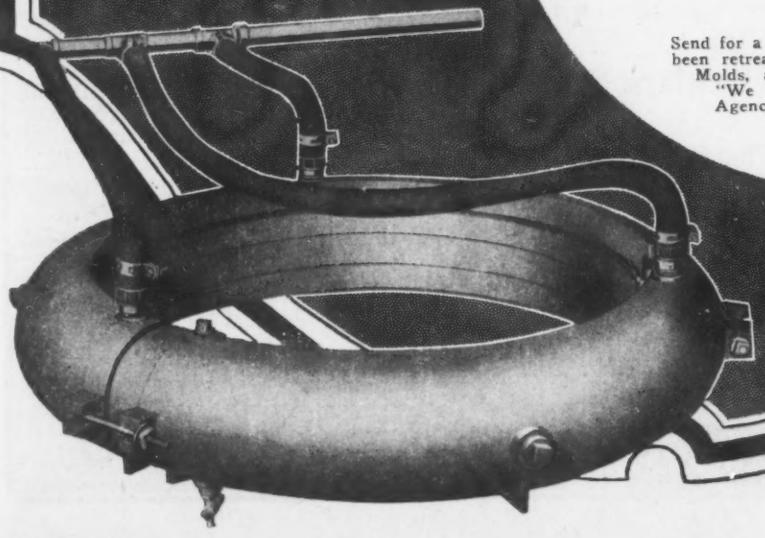
We will teach free of charge any of our customers who are not familiar with the Retreading business. Using the Vulcan method our course of instructions requires only a few days to make you an expert vulcanizer and retreader, enabling you to do work of the highest class without delay or error. Let us tell you of our special payment plan which finances you so that you can pay for Vulcans after they begin earning for you. Fill out the coupon for complete information.

A. B. LEGNARD

SHERIDAN RD., WAUKEGAN, ILL.

PROOF

Send for a cross-section of a tire that has been retreaded by our Vulcan One Cure Molds, also circulars, prices, etc., "We are appointing State Agencies to reliable parties."

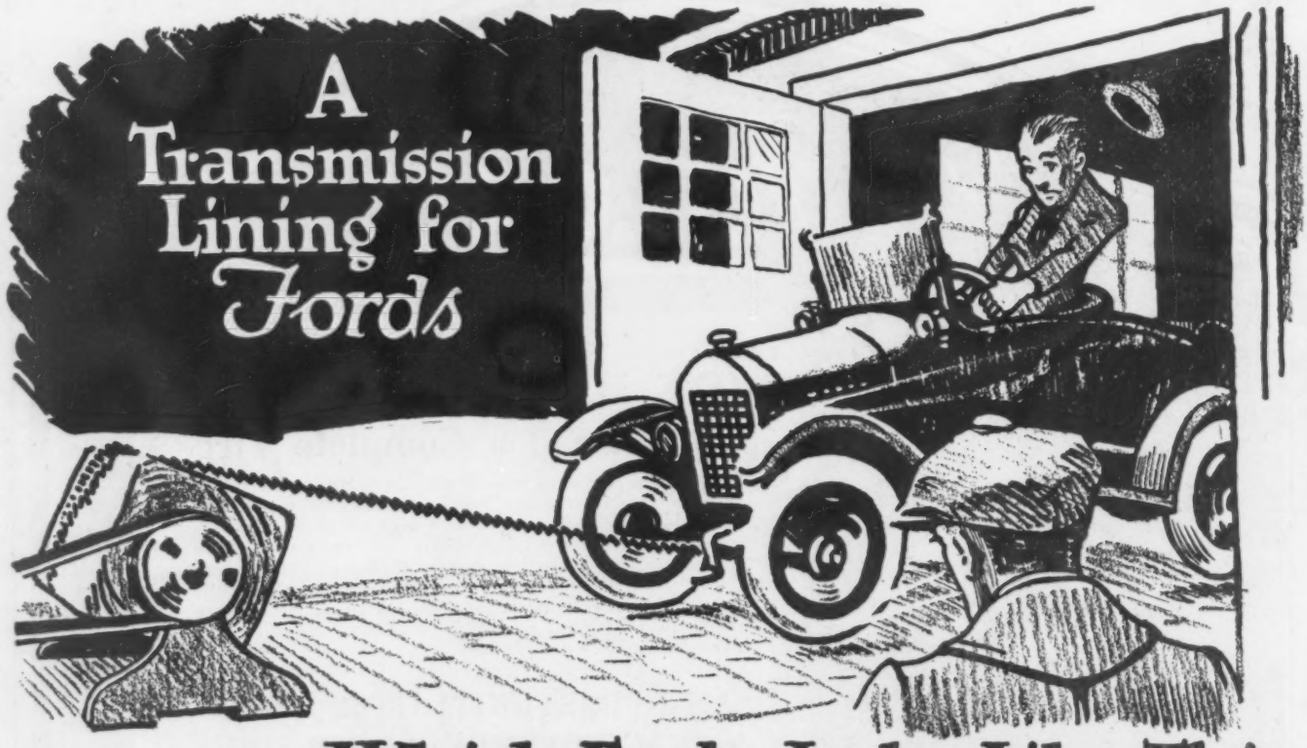


A. B. LEGNARD CO.,
Waukegan, Ill.

Gentlemen:
Send me full details
of ☐ Cash prices,
☐ Special payment plan,
☐ Course of instructions.

Name.....

Address.....



Which Ends Jerks Like This

Ever ride in Fords that jerk as if they were being **towed by a square windlass** every time they start, or go from first to second? That's all due to worn, hard or glazed transmission lining—it ends when you install

REFLEX CORK TRANSMISSION LININGS

REG. U. S. PAT. OFF.



Will Not Harden or Glaze

Reflex is a special lining treated by a secret process. It wears two to three times as long as ordinary lining, remaining soft and pliable at all times, and eliminating that unpleasant jerk so common to many Ford cars. This not only adds to the pleasure of driving, but actually saves wear and tear on motor and rear axle, which is so often a forerunner of mechanical trouble and expensive repairs.

Dealers Who Sell Reflex Cork Render a Service as Well

Why not sell your customers a product that more than fulfills its prescribed duty? Reflex will give your customers more satisfaction in performance and wear than the ordinary transmission lining. Reflex is a good salable article at the right price.

Ask Your Jobber

Reflex is sold through the regular jobber and dealer channels. If your jobber should not have Reflex Cork, write us direct for complete information and trial set, mentioning his name.

REFLEX AUTO ACCESSORY CO., Inc.

FORT WAYNE, INDIANA

The Biggest Attraction in Accessories at the New York *and* Chicago Auto Shows



WHEN you entered the Accessory Divisions at either the New York or Chicago Auto Shows and looked for the crowds, you invariably found them at the Stewart-Warner-Exhibits.

Why? Because everyone interested in motor cars knew from past experience that it is there you will find the latest and best in accessories. And they were not disappointed this year.

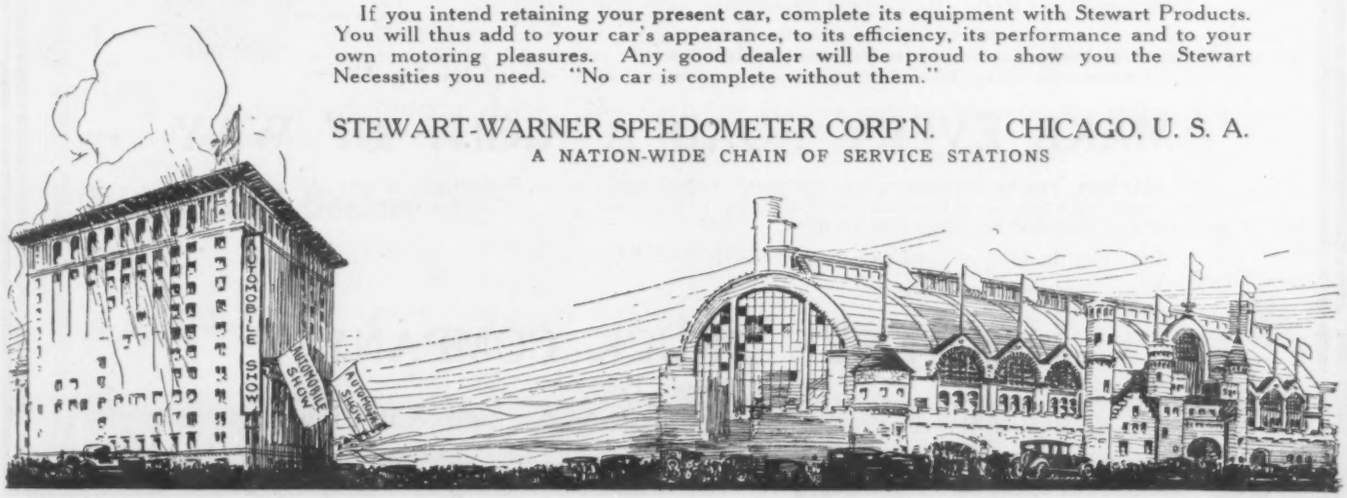
The 1920 line of Stewart Custombilt Necessities contains many new and important accessories, and is the most complete ever offered motorists. Never has a line of accessories achieved such universal popularity, such dominance in the field.

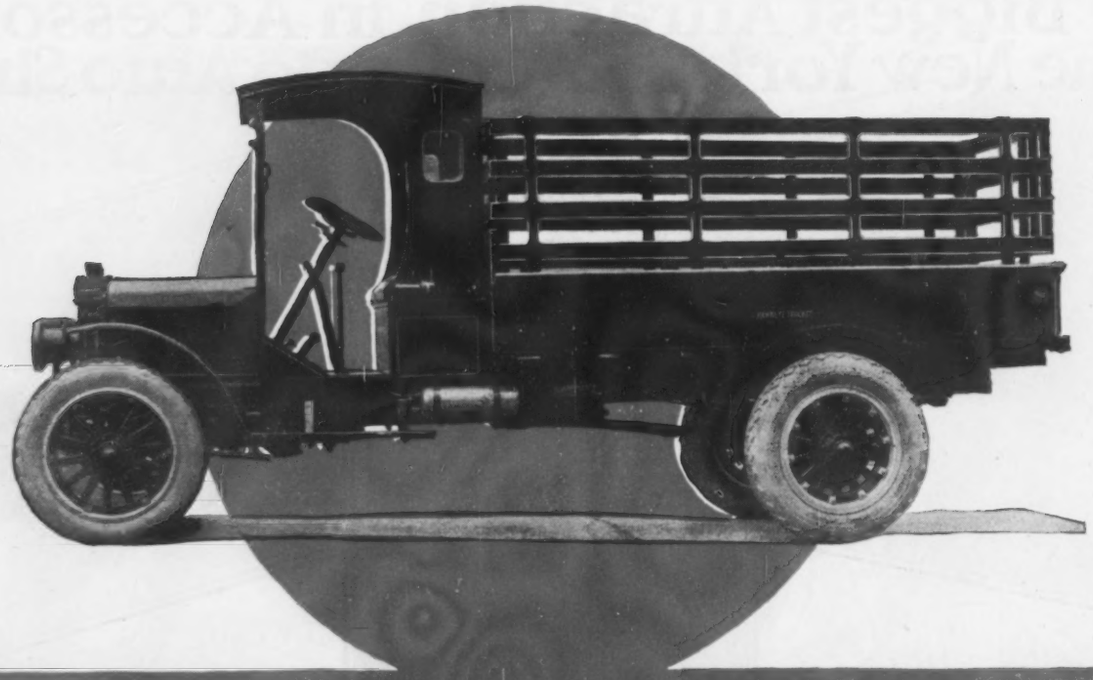
If you are going to buy a new car this year see that it is completely Stewart-equipped. You can accurately judge the value of a car by its equipment. Look for the name Stewart.

If you intend retaining your present car, complete its equipment with Stewart Products. You will thus add to your car's appearance, to its efficiency, its performance and to your own motoring pleasures. Any good dealer will be proud to show you the Stewart Necessities you need. "No car is complete without them."

STEWART-WARNER SPEEDOMETER CORP'N. CHICAGO, U. S. A.

A NATION-WIDE CHAIN OF SERVICE STATIONS





HAWKEYE
MOTOR TRUCKS

Motor Trucks are bought for just one reason—

Because the motor truck is the most economical means of promiscuous transportation

We say *promiscuous* transportation because steam and electric railroads operate on fixed, unchanging routes, while the motor truck should operate anywhere and everywhere.

Now if a motor truck is bought because of its economy and efficiency in promiscuous transportation, the user should not be required to operate that truck on certain well paved streets or well built roads—fixed routes. So doing, he *restricts his truck* to a *narrow right of way*. Hawkeye Trucks

MAKE EVERY ROAD A RIGHT OF WAY

Hawkeye Trucks have more load carrying strength and greater load moving power. Hawkeye Trucks are built for work—*hard work*—in mud, in snow, in sand, on hills and under every adverse condition of road and load that may confront them.

Isn't this the kind of truck you want to sell?

Write for complete details.

HAWKEYE TRUCK COMPANY

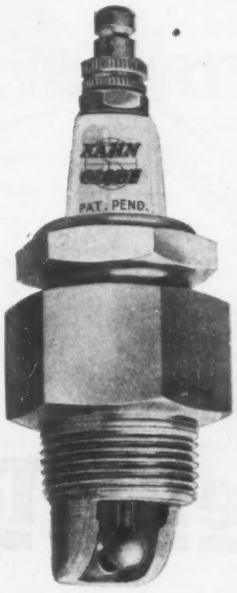
R. A. Bennett, President

616 Sixth St., Sioux City, Iowa

TRIED and PROVED
A Better Plug

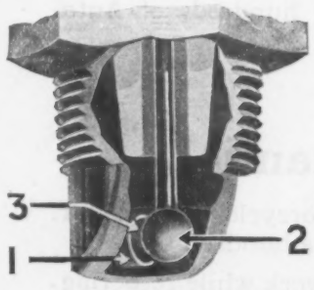
A Better Plug — it's a big claim to make, but it's made in the knowledge of actual tests that cover a period of many months, made under every possible motor condition and in every type of gasoline motor equipped machine,—auto, truck, motor boat, tractor, aeroplane and stationary engine,—tests that have proven and substantiate every claim that we make for this new spark plug.

Its design embodies the best time-tried features of spark plug construction, plus the exclusive Kahn Globe Ball and Socket Firing End—the feature which gives this spark plug its high efficiency under all motor conditions.



The Kahn Globe insures complete and perfect combustion, which means carbon deposits reduced to a minimum, no fouling of the plugs, the use of a lean mixture of gasoline, maximum power and easy starting in cold weather. Saving in gasoline of from 15 to 40%, the elimination of overheating and a more smoothly-running motor have resulted from practically every test that was made.

Recommend and sell the Kahn Globe Spark Plug to the man who is having spark plug trouble! Oil or carbon that will foul any ordinary plug so it will fail to fire does not bother the Kahn Globe. Its construction and the high grade material used practically eliminates broken porcelain. No spark plug is as carefully made or inspected to assure perfection,—and customer satisfactoin, as the Kahn Globe.



Here's the Reason for the Kahn Globe's High Efficiency

1. Firing socket. Made of special alloy, will not fuse or pit. Riveted to shell itself. Cannot become loose like common electrodes on other plugs.

2. Firing Ball. Special steel ball that will not fuse or burn off.

3. The rigid construction of the Kahn Globe overcomes any variation in the distance between the ball and socket firing ends. This also prevents fusing and pitting.

Jobbers and Dealers—The Kahn Globe Spark Plug opens a new field of real spark plug profits and customer satisfaction. Our distributors and dealers are going to get real sales co-operation from us. Write us today and get our proposition.

KAHN MFG. CO., 2602 Vliet St. MILWAUKEE, WIS.

Better Because They Stand The Severest Tests



This Is The Peg To Hammer!

Aim your heavy blows at the class of work that nets you a REAL PROFIT. Cylinder Re-Boring is the business to go after. Requires practically no time or upkeep expense if you install the Automatic

Marvel Cylinder Re-Boring Machine No. 5

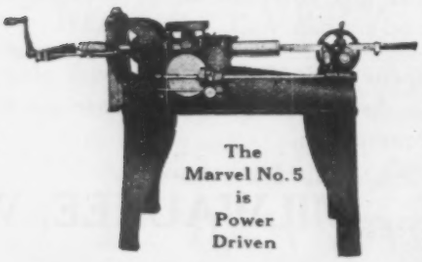
The machine that has been purchased, used and endorsed by hundreds of Automotive Repairmen and Colleges.

The Marvel No. 5 has proven best by every test.

Automatic—Accurate—Substantial

It has speed and capacity—handles any gas engine from a Motorcycle to a Tractor. May be used for boring pulleys, drive wheels, gears, and put to a hundred uses.

It doubles the man-power in your shop, as a man can do other work while re-boring.



We Co-operate With You

Our Business-Building Service helps you get the business. Our Marco Pistons help you hold it.

Write for full information today.

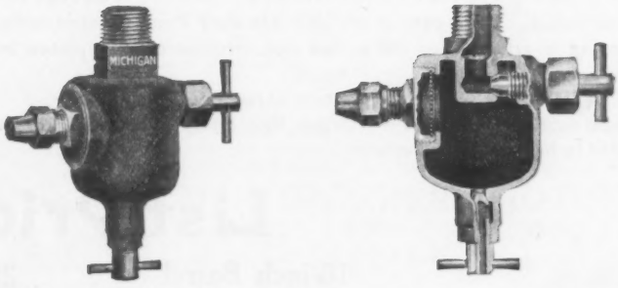
MARCO

Marvel Machinery Company

1299 South Third St. Minneapolis, Minn.

MICHIGAN LUBRICATOR COMPANY

Michigan Sediment Traps



THEY CLEAN THE GASOLINE

1. Screw it into the tank.
2. Connect the feed line to it.

and

3. Strainer will catch the dirt.
4. Settling chamber will catch the water.
5. Drain valve will drain the water.
6. Valve will shut off the gasoline.

MANUFACTURED BY

MICHIGAN LUBRICATOR CO.

657-687 BEAUBIEN STREET

DETROIT, MICHIGAN

"It's easy" with a Morgan Red Pump

Just a few easy strokes with the Morgan Red Pump (practically one-half the number required with an ordinary hand pump) and your tires are inflated to their full capacity. No fatigue, no sustained effort. The special valve used in the Morgan Red Pump is an extraordinary point and is unusually light. This reduces air pressure to a minimum and lets the full barrel capacity of air be expelled into the tire on each down stroke of the piston. The complete vacuum thus created is filled with cold, fresh air on each up stroke. This feature is exclusive with the Morgan Red Pump and explains its remarkable speed and ease of operation.

The barrel is made of heavy, cold drawn steel base and top clamped together by strong steel braces. The leather inside can be easily renewed by drawing it through the bottom of the barrel when the base is detached. Each part of the Morgan Red Pump is accurately machined, and a carefully tempered spring is attached to the piston rod, preventing the piston from striking the barrel on the up stroke.

The hose is five-ply Goodrich, the best obtainable.

The steel foot strap allows the Morgan Red Pump to be used either vertically or at any angle. Finished in fire engine red enamel.



List Prices

18-inch Barrel	22-inch Barrel
$3.50	$4.00

PACKED FOR SHIPMENT IN LOTS OF 12 AND 25

Manufactured by
The Morgan Mfg. Co., Inc.
South Keene, N. H.

DEALERS

Already without any selling effort the demand for the Morgan Red Pump has been tremendous. We are now ready to supply dealers throughout the United States. We offer an extraordinary proposition.

Announcement

The Huffman Six is now complete. We are perfecting our sales organization and invite those dealers to get in touch with us who desire to sell a strictly quality car that is backed unconditionally by the home organization.

The Huffman will appeal particularly to those who can appreciate $2500 construction in a car at $1895—a car with a decided air of elegance and distinction.

The following specifications tell the Huffman Six story impressively:

SPECIFICATIONS

Motor—Continental 6-cylinder, 3¼x4½.
Transmission—Covert—three speed selective type, integral with motor.
Clutch—Borg & Beck 10 inch, 10 spline.
Lubrication—Combined force feed and splash.
Cooling—Centrifugal pump.
Springs—Front, 37", semi-elliptic Clemens, steel bushings fitted with oil cups and wicks; Rear 56", bottom leaf special alloy steel.
Axles—Front I-beam; rear full floating and spiral gear driven.
Tires—32x4" straight side, non-skid on rear.
Wheel base—120 inches.
Carburetor—Stromberg.
Dyneto—2-unit, 6-volt, starting and lighting system. Willard battery. Connecticut ignition.
Propeller Shaft Universals—Hardy flexible discs eliminate universal joint trouble and require no lubrication.
Weight—2,680 pounds.
Price—$1895—f. o. b. Elkhart, Indiana.

ADDITIONAL REFINEMENTS THAT PROVE THE CAR'S COMPLETENESS

Regular tailor made, actual one-man top.
Genuine leather straight plaited upholstery.
Inlaid linoleum covered running boards and floor boards.
Stewart-Warner speedometer.
Accurate gasoline gauge on tank.
12-ft. extension trouble lamp cord from instrument board light.
Three-way tonneau light.
Rigid tire carrier on rear.
Automatic shut-off ignition switch.
Double ventilating windshield.
Robe rail on back of front seat.
Large pocket in front doors and rear of front seat.
Complete set of good tools, jack and pump.
Motometer on radiator cap.
10x24" plate glass rear curtain window.
Side curtains open with doors.
Colors—Foch Gray, Victory Blue, Huffman Maroon.

Write us for our attractive circular which fully describes, shows actual photographs and gives more detailed information of the Huffman Six.

HUFFMAN BROTHERS MOTOR COMPANY
Factory, Elkhart, Indiana

Showroom, 2425 Mich. Ave., Chicago, Ill.

Huffman 6

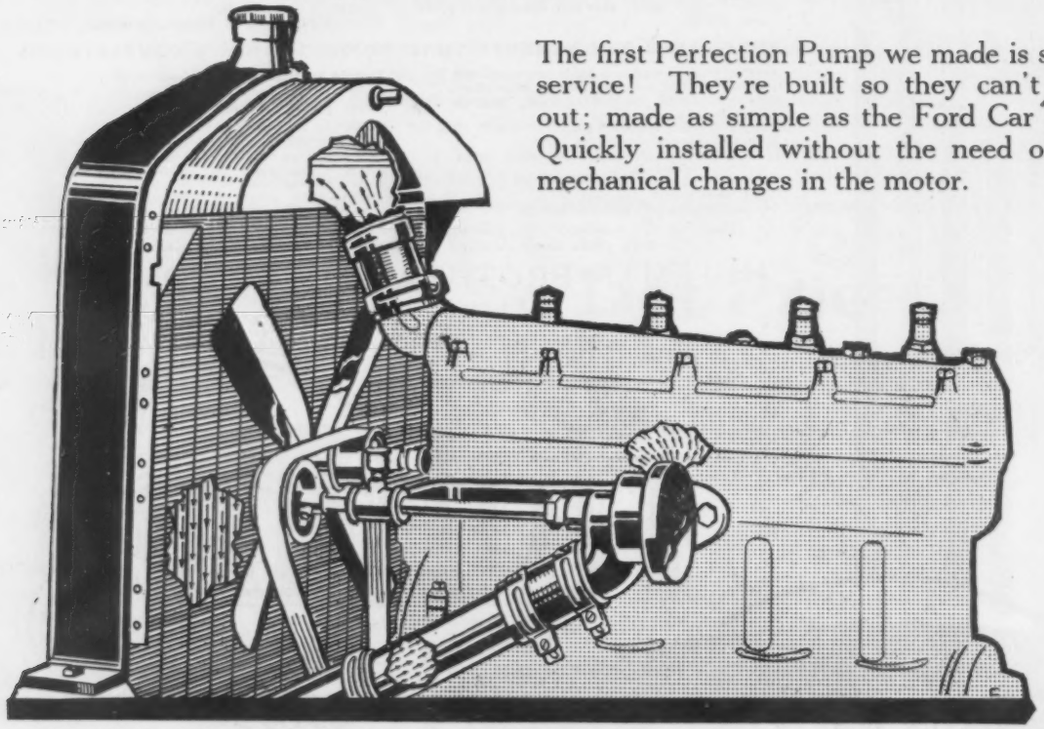


$1895
f. o. b. Elkhart

YOU CAN'T RUN A FORD ON STEAM!

—and every time a Ford is "blowing off" like the safety valve on a Mogul Locomotive, it means there's real money going "up in the air." There's just one way of stopping a Ford from constantly trying to turn itself into a steam engine, and that's by equipping it with a

PERFECTION WATER CIRCULATING PUMP



The first Perfection Pump we made is still in service! They're built so they can't wear out; made as simple as the Ford Car itself. Quickly installed without the need of any mechanical changes in the motor.

FOR 100% EFFICIENCY THE YEAR 'ROUND

That's what every Ford Owner is after—and that's what you can guarantee him when you sell him a Perfection Water Circulating Pump. The Perfection Pump prevents over-heating, reduces the chances of freezing to a minimum, maintains an even maximum temperature that spells More Power on less Gas and Oil. Eliminates the expensive repairs due to frozen radiators in Winter and burned out bearings the balance of the year.

Perfection Pumps do for Ford Owners just what any real pump does on the high priced cars. Cuts out the worries, saves your anti-free solution by not evaporating it in the form of steam.

Write for folder telling how one man drove 2165 miles on less than four quarts of oil and added only two quarts of water to his radiator on the whole trip. If you want to sell the maximum of service for the money, get the Perfection Water Circulating Pump.

Jobbers, Dealers and Garagemen:—Get our proposition and see for yourself the profits that can be made handling this pump. "Get hep" to our selling helps that bring the business to you.

FELKER BROS. MFG. CO., MARSHFIELD, WIS.

Gasoline Cost Has Advanced and—



—WE believe NITRO with its gasoline saving of over 25% should be of interest to every motorist.

The big reason chauffeurs have rallied to NITRO is because it just naturally relieves them of a lot of mechanical annoyances and they have enjoyed the increased mileage and power and the satisfaction of no further carbon troubles.

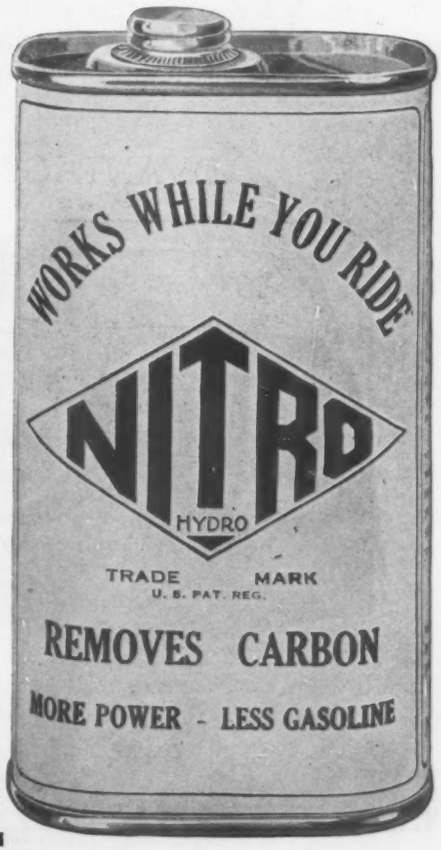
NITRO is a scientific formula that combines instantly with gasoline. It brings the quality of the gas back to 76. It won't harm the mechanism or interfere with lubrication.

It is a fact that NITRO frees valves, cleans spark plugs, valve seats and other parts of the internal combustion engine and removes carbon. In quality NITRO is closely allied to nitrogen and when it is mixed with gasoline it **causes a quicker ignition** under the electric spark, requires a greater expansion space than gasoline and so consumes deposits of carbon "while you ride," forcing it out through the exhaust pipe.

When dealers and jobbers begin to realize the sales possibilities behind NITRO—when they really appreciate the enthusiastic approval of every chauffeur, dealer and jobber who has tested it under the most difficult conditions—then, and then only, will they begin to cash in on the demand for a thoroughly reliable carbon preventative.

NITRO has proved itself in every test devised by automotive engineers and authorities on the internal combustion engine. It is guaranteed to increase mileage 20%, power up to 40% and to remove carbon and prevent its further formation.

If it fails—give the customer his dollar back and we'll repay you.



LIST PRICES

Eight-ounce Cans, $1.00 **Gallon Cans, $12.00**

Let Your First Order Be a Convince-Me Order.
Write or Wire NOW for Discounts.

The Reilly-Snyder Mfg. Co., Inc.

245 W. FIFTY-FIFTH ST. NEW YORK CITY

ATWATER KENT

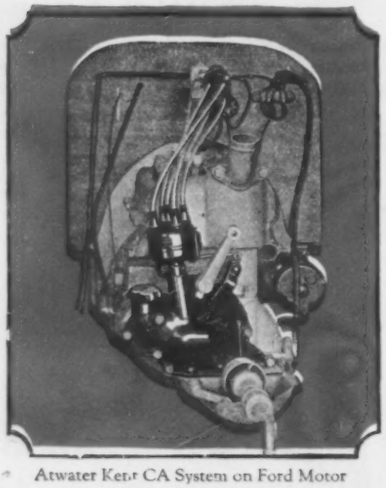
Type CA *IGNITION Outfit for* FORDS

Equipped with electric starting and lighting, 1919 and later models

THE Type CA Outfit for Fords is furnished absolutely complete on a special mounting which fits the front of the new style Ford engine. All wiring required is cut to the proper length ready for connecting up the system. A special socket wrench is supplied for use when attaching the mounting to the engine. All these minor parts are as rigidly inspected and held to the Atwater Kent quality-first standard as the Unisparker and coil themselves. The special Ford mounting holds the Unisparker in an upright position where it is fully protected from oil and grit, and readily accessible for inspection.

Mr. Dealer: Thousands of Ford owners will appreciate your calling their attention to the

ADVANTAGES OF ATWATER KENT IGNITION *on the* FORD



Atwater Kent CA System on Ford Motor

1 The same hot spark at all speeds from cranking to maximum. Not dependent on motor speed like a magneto.

2 This hot spark at low speeds permits throttling down to three or four miles per hour.

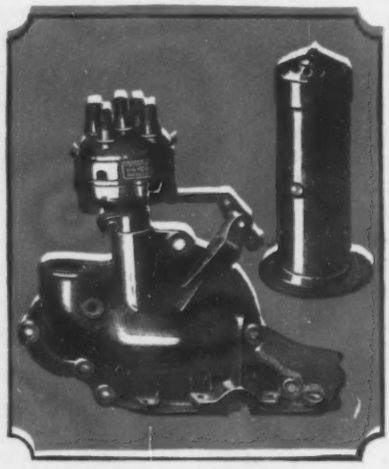
3 Makes starting easy in all weathers by furnishing a hot, fat spark as soon as contact is broken, regardless of motor speed.

4 This easy starting prolongs the life of the storage battery.

5 Automatic spark advance reduces gear shifting to a minimum, increases mileage per gallon and adds to ease of driving.

6 Auxiliary spark lever permits of manual spark advance.

7 Fool-proof in construction—one adjustment only and that made with an ordinary screw-driver.



Type CA System and Coil

ATWATER KENT MFG. COMPANY *Philadelphia*

4934 STENTON AVENUE

Stewart Wire Wheels

"That Hub Makes Stewart Wheels Beat All the Rest"

"That hub *guarantees* positive, absolute safety. Inside that hub is the Stewart patented 'reverse taper' construction, taking up all the strain that in most other wire wheels is thrown directly against a frail hub-cap."

"Stewart Wire Wheels positively cannot come off by accident, and that factor of absolute safety makes my customers prefer Stewart Wheels to any other wire wheel on the market."

Quick Changes, Beauty, Comfort and Economy

Tire changes quickly made. Simply remove hub cap. Give wheel one-eighth turn and slip off. Slip on other wheel. Give one-eight turn and apply hub cap. Easiest wheels on earth to change. Stewart wheels add attractiveness to your car. Their sturdy resiliency absorbs all road shocks and increases comfort in riding. They save tires and gasoline, giving you real economy in increased mileage and actual expense saved.

Read this Remarkable GUARANTEE

Every set of Stewart Wire Wheels and parts is guaranteed for one year from date of sale. Should the materials or workmanship prove defective, or should any breakage or damage (except to enamel) be sustained in an unavoidable accident during that period, the wheels or parts thereof will be replaced by us without charge to the original retail purchaser.

Set of 5 Stewart Wheels, with 4 inner hubs, 4 hub-caps, hub-cap wrench, etc. Choice of colors—black, white, cream, green, blue, red or khaki. For Ford Cars..... $70.00

Same equipment for Chevrolet "490" and Overland "4"..... $80.00

To Ford, Chevrolet and Overland Dealers:—*Stewart Wire Wheels offer splendid selling opportunities. Each set you sell makes more sales for you. The best-selling wire wheel on the market. Write for our attractive dealer proposition. Do it today.*

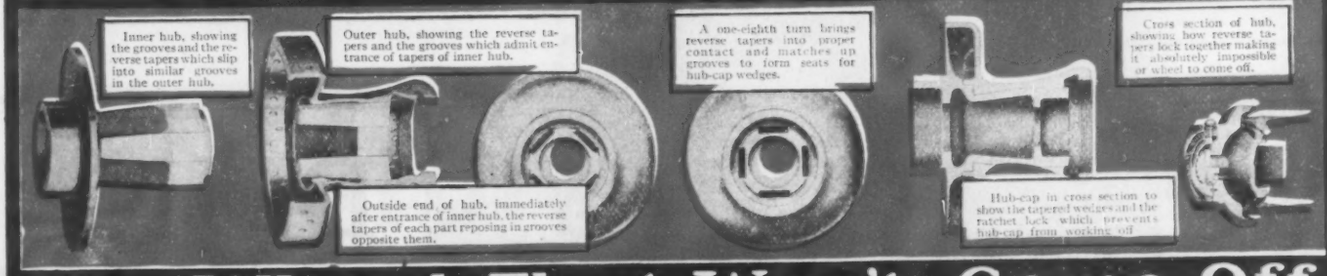
Write for Prices of Equipment for Other Cars.

STEWART WIRE WHEEL COMPANY

401-437 West Barner Street **Frankfort, Ind., U. S. A.**

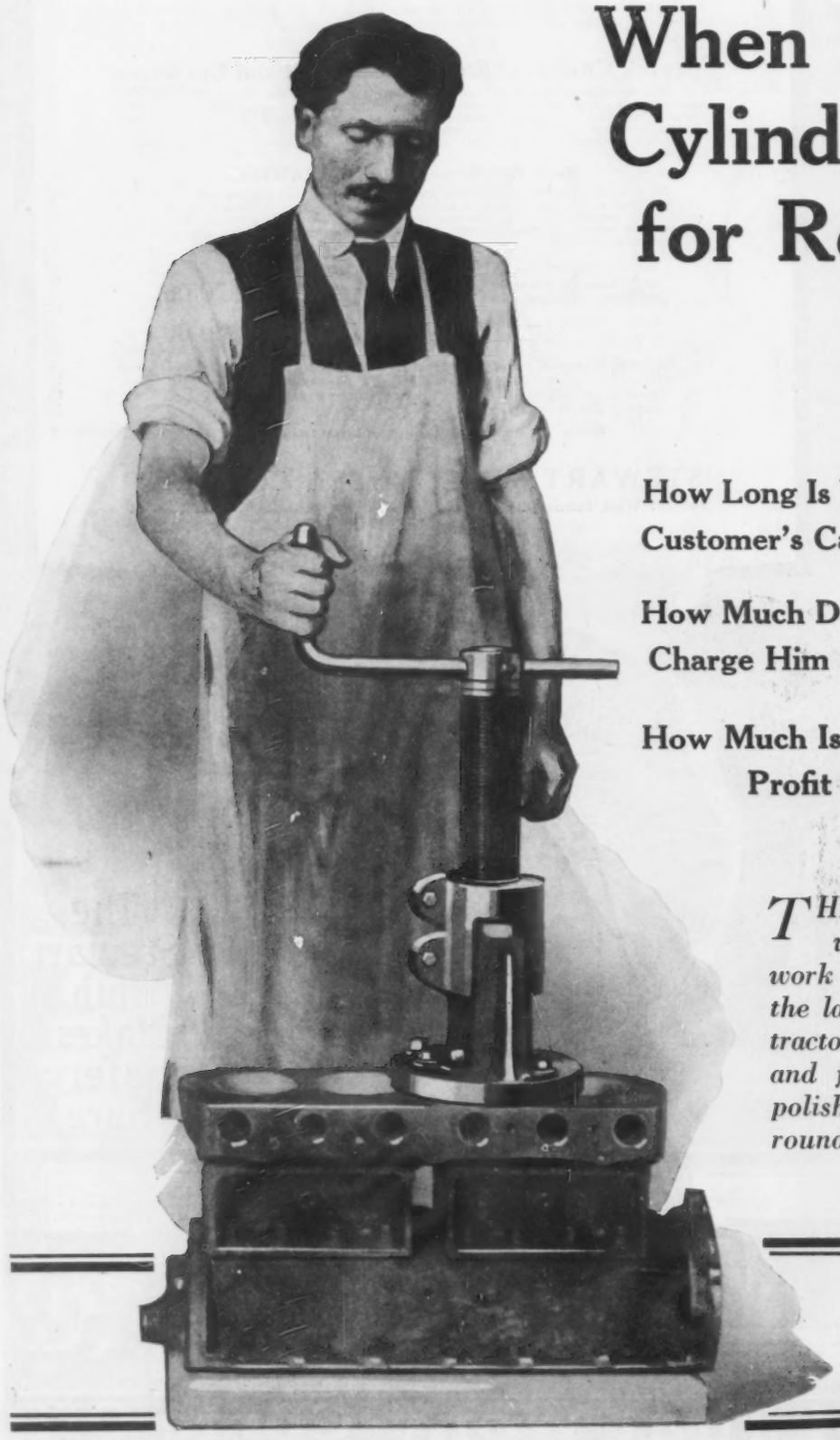


The Stewart Hub Makes Safety Sure



The Wheel That Won't Come Off

A "Glass-Finished" 4 Block



When You Send Cylinders Away for Reboring—

How Long Is Your Customer's Car Held Up

How Much Do You Charge Him for the Job

How Much Is Your Profit on the Job

?

THIS advertisement offers you ways and means to do the work in your ownshop — to save the laying up of the car, truck or tractor—to save the freight charges and finally to turn out a clean, polished job in two hours at a good round profit to yourself.

DUNN

Job Done in Two Hours

The Dunn "Every Motor" Reborer will handle any block with a cylinder diameter ranging from 2⅞ to 4¼ inches. Its extreme depth action is 9 inches.

The above statement condenses a big story of success—your success starting from the moment you put this reborer to work.

From the Ford to the Packard, Peerless and Locomobile in passenger cars—From the Ford to the Pierce-Arrow and Peerless, in trucks—and all that lies between—Here is your radius of action when you are equipped with this universally adjustable Dunn Reborer.

The Dunn Reborer makes a quick, clean job. In many instances the work can be done without removing the engine from the chassis. Two hours or less will serve to put a four cylinder block in first class condition. Your field is only limited by the number of cars, trucks and tractors around you, because

This is our Distributor's proposition

We Want Ten Distributors

They must be of broad vision and high responsibility—men who can see in our first advertising the great sales possibilities which lie in this cylinder reborer. An extensive trade advertising campaign will back them. Their lively cooperation will make for quick and growing sales. Each group of states calls for the right distributor. Write or wire.

New England States	Wisconsin
New York	Minnesota
New Jersey	Iowa
Pennsylvania	Missouri
Delaware	Nebraska
	Kansas
Maryland	No. Dakota
Virginia	So. Dakota
W. Virginia	
No. Carolina	Arkansas
So. Carolina	Louisiana
	Texas
Georgia	Oklahoma
Florida	
Alabama	Colorado
Mississippi	Wyoming
Tennessee	Montana
	Utah
Ohio	New Mexico
Indiana	Arizona
Illinois	
Kentucky	California
	Washington
Michigan	Oregon
	Idaho
	Nevada

This $60.00 Tool Will Handle Nearly Every Cylinder Size Known

HOW IT IS DONE

A simple centering device is furnished with each machine.

The bit is finely adjustable. A slight turn following the graduated scale shown here will give as fine as 1/1000 of an inch adjustment. Its total range is 1⅜ inches. By a slight change in the centering device, we can even accommodate 4½ inch bores.

Now as to the method of attaching: three simple devices make a quick, firm "couplings" with blocks of any design. We also furnish at a very small additional cost a DRILL PRESS CONNECTION, which still further reduces operating time. All in all, nothing is wanting to make general use possible.

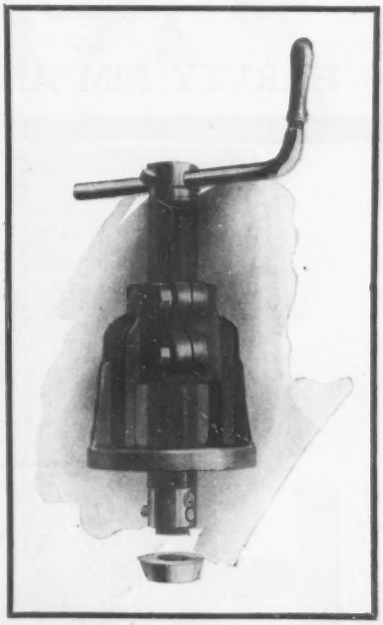
THE FINISHED JOB IS CLEAN

The ⅜ inch bit travels with a fine feed. The result is a smooth, highly polished surface that is good enough to make burnishing superfluous—a surface as true as human skill can make it.

TO THE TRADE

The Dunn "Every Motor" Reborer pays for itself in the first few jobs. After that, your profit is gross. The two hours' service you render will draw trade from all over your territory—operation is easy for hand, easier by drill-press—the finished work perfect—the earnings well worth while.

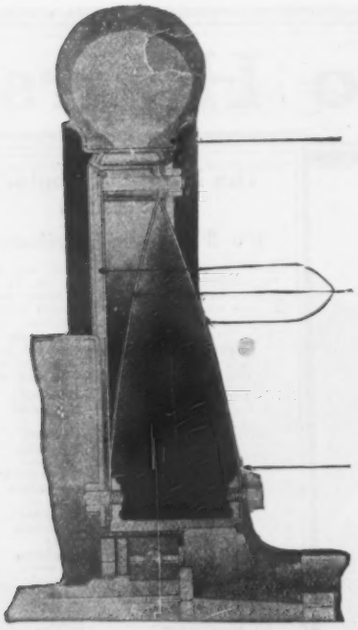
And the cost of the tool is about half of other less flexible and more complicated devices. Add it to your equipment NOW. Write for details.



J. EDWARD DUNN COMPANY

1 Bethune St. New York City

"Every Motor" Cylinder Reboring



Tire held solidly in place by self inter-locking, demountable rim. Tires can be changed in two minutes. Spare is carried on its own rim. No necessity for a "fifth wheel." Squeaks and tire-creeping forever eliminated on the HARVEY.

Three all steel (20 gauge) discs, two converging to the straight disc in the center. A hollow steel wheel reinforced at all points, therefore a stronger than a solid wheel but much lighter. This scientific construction makes the HARVEY STEEL WHEEL more durable and immune to "side swipes," skidding and treacherous road shocks.

The outside, as well as the inside, offers a smooth surface with no wind resistance, no projecting parts, and easy to keep clean. The superior strength of this wheel is apparent in the **equal distribution** of the weight and shocks on all three discs.

BEAUTIFUL: In design the HARVEY STEEL WHEEL implies reserve strength. Finished in a solid color, with no protruding parts to catch dust, oil or mud—it adds that touch of distinction to any car that all motorists are keen for.

STRENGTH: Three 20-gauge steel discs scientifically combined into a solid unit gives a wheel strength that smiles at "side swipes" and laughs at skidding. The strongest steel wheel that ever absorbed the shocks of a treacherous road. It won't buckle and it can't collapse.

RESILIENCY: All the strains and shocks are **equally distributed over entire circumference—not** passed on to the chassis and the tires. The scientific construction of the HARVEY WHEEL makes this possible.

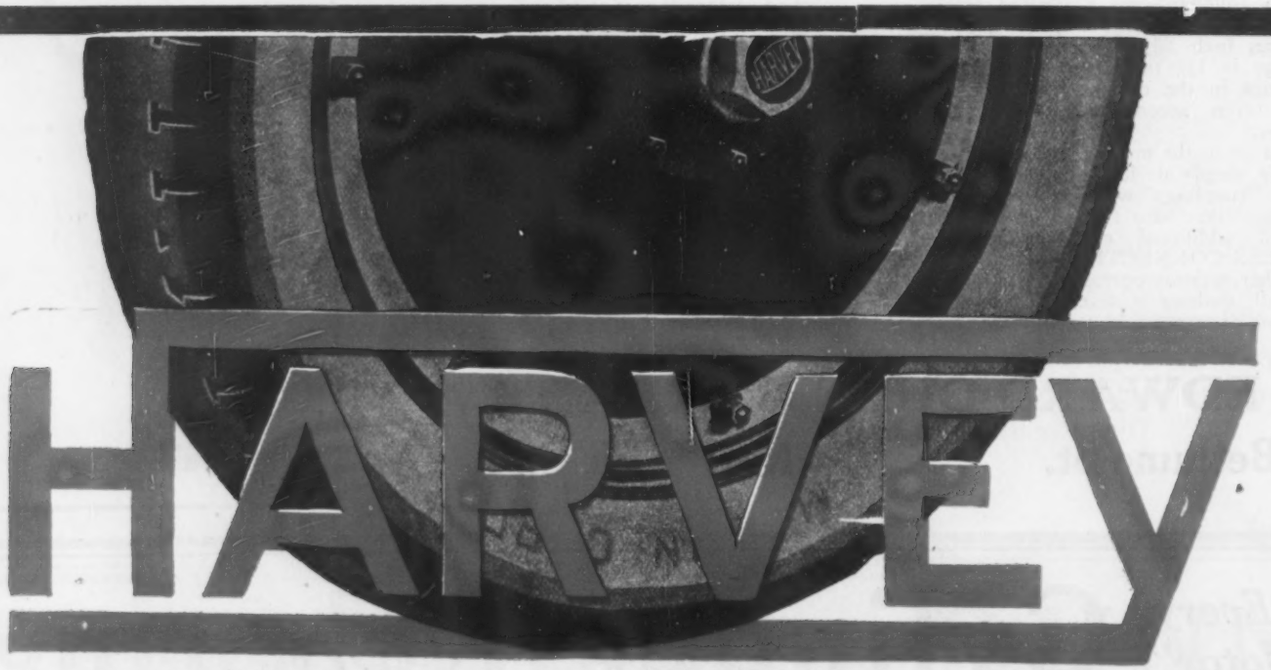
EASY TO CLEAN: Inside and outside discs have a smooth surface with no projecting, ugly parts to catch oil and road stains.

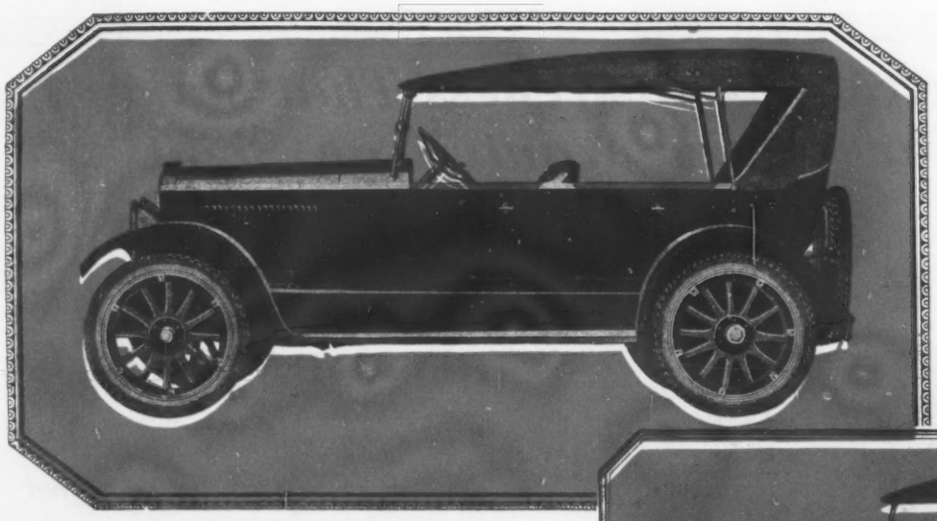
QUICK TIRE CHANGE: Only seven nuts to release, and off comes the **only self inter-locking demountable rim ever offered with a steel wheel.** Tires can be changed in **two minutes.** No irons, wedges, tugging or pulling. Surprisingly simple, but mighty efficient.

OUTLAST THREE CARS: Built on a scientific principle, with few parts, the HARVEY STEEL WHEELS will outlast three ordinary cars because they are immune to the weaknesses of make-shift wheels and are built for **future** service as well as present.

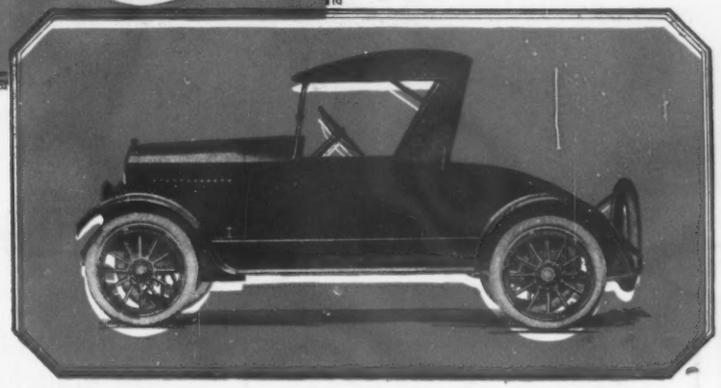
Shall we send you our booklet describing HARVEY STEEL WHEELS in detail? A two-cent stamp will bring it.

HARVEY RIM AND WHEEL COMPANY BUFFALO, N. Y.





$1245
f. o. b. factory



"Looks Good—ana Is as Good as it Looks"

SKELTON

Here is the basis upon which we command your interest:

Appearance and actual mechanical merit considered, the greatest a tomobile today selling near its price, $1245.

The wheel base is 112 in., the motor a standard four cylinder 3½ in. x 5 in. The company is adequately financed and has production facilities that place it in a most advantageous position.

Which should prompt you to write at once for the Skelton proposition or call upon Mr. Chapman at LaSalle Hotel during the Chicago Show.

SKELTON · MOTORS · CORPORATION
SAINT LOUIS

It Adds a Touch of Exclusiveness That Makes the Motor Car Owner Want it on Sight



The windshield adjusted Close to the Occupants of the Tonneau.

THE NEW PERKINS TONNEAU WINDSHIELD

Was enthusiastically endorsed by dealers at the New York and Philadelphia Shows.

THE flexibility of this comfort-making windshield appeals to the motorist instantly.

It can be firmly adjusted at any angle overcoming draughts from any direction and it is so well made and perfectly designed that it will not jar loose or rattle.

There can be no question about the existing demand for a high grade, well constructed tonneau windshield, not only in your territory but abroad. Orders were placed at the recent shows by dealers from Sweden, Denmark, Argentine, Spain and India—and now requests are coming from **every section of the country.**

The Perkins Tonneau Windshield is the natural accompaniment of the high grade motor car.

Made of the best 3-16 in. plate glass with highly finished, sturdy metal parts — it offers **the dealer a** quality article selling at a handsome profit.



THE PERKINS TONNEAU WINDSHIELD

can be lowered and folded to form a convenient table for the use of road maps and serves also as a firm luncheon table.

By designing this windshield along practical lines the motorist is able to move the shield exceptionally close to the occupants of the rear of the car without disturbing the baggage or interfering with foot room.

The two side shields are independently adjustable and may be set at varying angles to the center shield.

The entire shield may also be tipped at any angle.

Write now and complete arrangements for handling this windshield in your territory—the business is worth while.

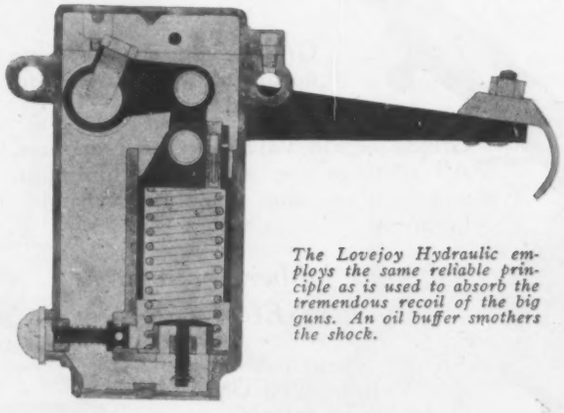
Perkins Tonneau Windshield Co., Inc.

1931 BROADWAY NEW YORK CITY

PERKINS TONNEAU WINDSHIELD



The Lovejoy Hydraulic Shock Absorber employs a cushion of oil to control excessive spring action. The body of the instrument forms an oil filled reservoir, which supplies an inner cylinder. A hollow piston forces the oil back to the reservoir against the pressure of a relief valve spring, thus absorbing the energy stored in the automobile spring and preventing violent movement of the body of the car.



The Lovejoy Hydraulic employs the same reliable principle as is used to absorb the tremendous recoil of the big guns. An oil buffer smothers the shock.

The Owner Will Pay For Comfort

IF you are an automobile dealer you know that comfort does more to influence car sales than any other single factor. The prospective buyer insists on it. You can make better satisfied owners and an extra profit by installing Lovejoy Hydraulic Shock Absorbers as special equipment.

It is the kind of equipment that sells side by side with the finest cars because it is built up to the same high standard. It gives real riding comfort on any road at any speed; it demands no lubrication, no adjustment, no care—save for an annual inspection; and years of use will not start a squeak or rattle. Your sales profit is not eaten into by service demands.

The Lovejoy Hydraulic sells at a price which makes it a reasonable investment on any car and comes to you with a discount which allows a liberal profit. Back of it is a sincere guarantee, an evidence of our faith in our product. Let us tell you the whole story. Write us today.

THE PACKARD
ENGINEERING COMPANY
1824 EUCLID AVE. CLEVELAND

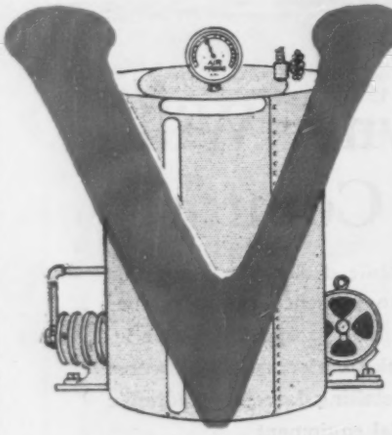
LOVEJOY Hydraulic
SHOCK ABSORBERS

Does the Job in half the time

This is not a claim. It's a proven fact, demonstrated by repeated tests of the Veltum Pneumatic. Flexible speed is combined with **perfect control.**

Absolutely guaranteed to do the work and stand up

OVER 20,000 NOW IN USE



VELTUM PNEUMATIC VALVE GRINDER



The Veltum Pneumatic permits any speed from 50 to 1,000 strokes per minute, making it unnecessary to go over valve second time.

Does the entire job on a valve without stopping.

Operates on 15 to 500 lbs. of air from the air tank you now have.

Plenty of power to grind any size valve, and attachments to fit all styles of valves.

Grinds valve cages as well as valves.

Fits over-size valve stems into valve guides.

Quickly relieves stuck valves.

Does very delicate work, such as grinding carburetor float valve stems and fuel system valves.

Grinds valves that have no provision for tool to fit in head.

Grinds eighth valve on Ford engines. All castings are made of aluminum, which gives the machine unusual lightness.

Ask your jobber about the Veltum PNEUMATIC

All prominent jobbers stock the Veltum PNEUMATIC. Order yours today.

Price $22.50

WARNOCK-WIRTH COMPANY

Dept. of Sales

624 S. Michigan Ave., Chicago, Illinois

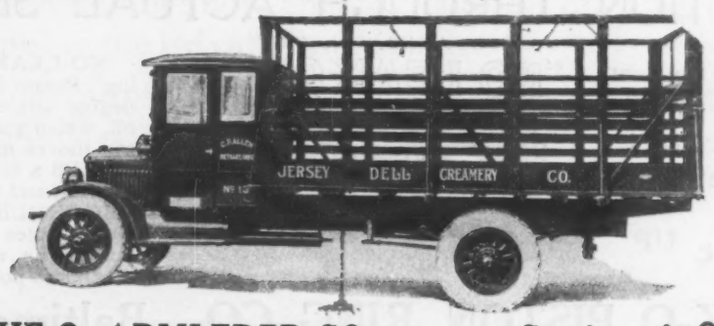
LONG LIFE

To a greater extent as time goes on, Motor Truck buyers are investigating the length of service of the truck presented for their approval. It is here that Armleder Motor Trucks surpass competing makes. By customer's testimony and evidence, our Dealers are prepared to prove our right to claim that the Armleder is **the most durable truck built.**

ARMLEDER
MOTOR TRUCKS

Here are a few of the reasons why Armleders operate for years with such a low average of repairs and replacements. The Armleder patented springs are extra sized with every leaf vanadium steel and are rid of all shackles, bolts or grease cups. Road jars and strains are absorbed by their action, thereby reducing depreciation. The Radiator also rides on springs and is thus cushioned against the jars of traction. The wheels are made with two extra spokes and are specially reinforced to last for years. Radius Rods that relieve the springs and prevent universal joint trouble and a sturdy, dependable frame are but a few of the innumerable reasons for the LONG LIFE of Armleder Motor Trucks.

The Armleder Dealership is a decidedly preferable one. The few territories open will soon be closed. Write at once. 2 and 3½ tons Worm Drive.

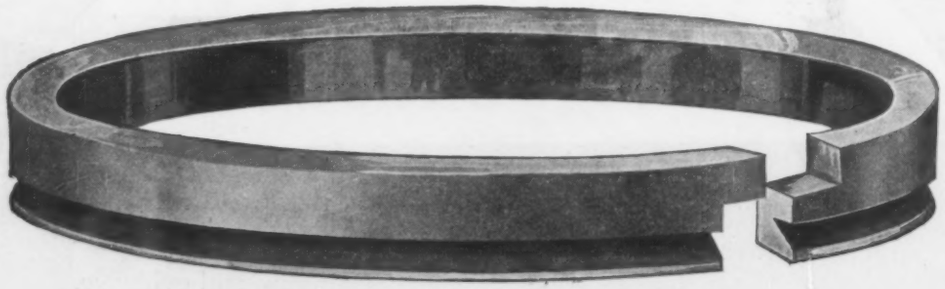


2½ Tons

3½ Tons

THE O. ARMLEDER CO. **Cincinnati, O.**

1-Ton



Beware—Attempted

IMITATIONS

NO-LEAK-O

PATENTED

REPUTATION THROUGH ACTUAL SERVICE

On the Market Five Years
1,000,000 a Month

Popular Because
They **"Make Good"**

PRICE **50c** UP

BUY THE "ORIGINAL"
"NO-LEAK-O"



"NO-LEAK-O" "oil-SEALing" Piston Rings have a 45-degree angle groove full of oil, which pulsates as the piston moves up and down and KEEPS a film of oil between the ring and the cylinder wall, REGARDLESS of warped or worn places on the cylinder wall. The motor maintains maximum power all the time.

NO-LEAK-O PISTON RING CO., Baltimore, Md.
FACTORY, MUSKEGON, MICHIGAN

On exhibition at Chicago Show, Booth No. 11, Armory; also Kansas City, Space A-17, Jan. 31-Feb. 7; Wichita, Kans., Tractor Show, Feb. 9-11; Kansas City, National Tractor Show, Feb. 16-21.



For Shipment
Under Private Brand

"But the Tube Must be a GOOD Tube!"

The Private Brand tube has many advantages: It gives the Distributor an exclusive tube market in his own territory. It adds to the prestige of his business. It enables him to give a direct guarantee.

But the tube must be a **good** tube.

Hardman Celebrated Tubes have stood the test of years. Their character today under highly modernized producing facilities is even superior to that which made them famous. Hardman Tubes, both Red and Gray, are made of full floating stock.

Increased volume now enables us to devote a percentage of output to the Private Brand trade.

Immediate consideration given to inquiries into a splendid propositon.

"Old as the Automobile"

HARDMAN RUBBER CORPORATION

Executive Offices: 9 East 40th Street, New York
Chicago Branch: 1712 So. Michigan Avenne
Factories: New Brunswick, N. J.

$100 REWARD

Will be paid by the manufacturer for the arrest and conviction on a charge of grand larceny or other felony charge of anyone operating an automobile while guarded by a

SECURITY AUTO THEFT SIGNAL

or tampering with the Theft Signal or trying to remove it from wheel of car without proper key.

Over 150,000 automobiles are being successfully protected from thieves and joy riders by the Security Auto Theft Signal System.

The Security Auto Theft Signal is the only known device which makes it possible to instantly identify the owner of the automobile —or on the other hand, to recognize the thief.



The Automobile is the easiest thing in the world to steal and the Security Auto Theft Signal is the only thing in the world that will protect it.

Dealers who stock the Security Auto Theft Signal quickly realize its value as a business builder.

Write your jobber or our nearest distributer listed below for discounts.

Security Manufacturing Company
Los Angeles, Cal.

The Auto Merchandise Co., Colorado, New Mexico, Wyoming, 315 Sixteenth St., Denver, Colo.

Auto Theft Signal Sales Co., Pacific Coast, 1066 South Hill St., Los Angeles, Cal

Campbell Bros. Co., Minnesota, Wisconsin and North Dakota, 98 South Tenth St., Minneapolis, Minn.

Campbell Motors Corporation, New England, 715 Beacon St., Boston, Mass.

R. A. Hays, Eastern Factory Representative, 253 W. 58th St., New York City.

D. E. Holmes, Ohio, 10 Garfield Place, Cincinnati, Ohio.

Security Auto Theft Signal Sales Co., Michigan, 580 Woodward Ave., Detroit, Mich.

Security Signal Sales Corporation, Delaware, Maryland, District of Columbia, Virginia, West Virginia, North Carolina and South Carolina, 206 West Tenth St., Wilmington, Del.

The Security Sales Co., Missouri, Kansas, Oklahoma, Louisiana, Arkansas, Tennessee, Kentucky, Southern Illinois, 622 Pine St., St. Louis, Mo.

J. B. Weber, Indiana, 125 South Illinois St., Indianapolis, Ind.

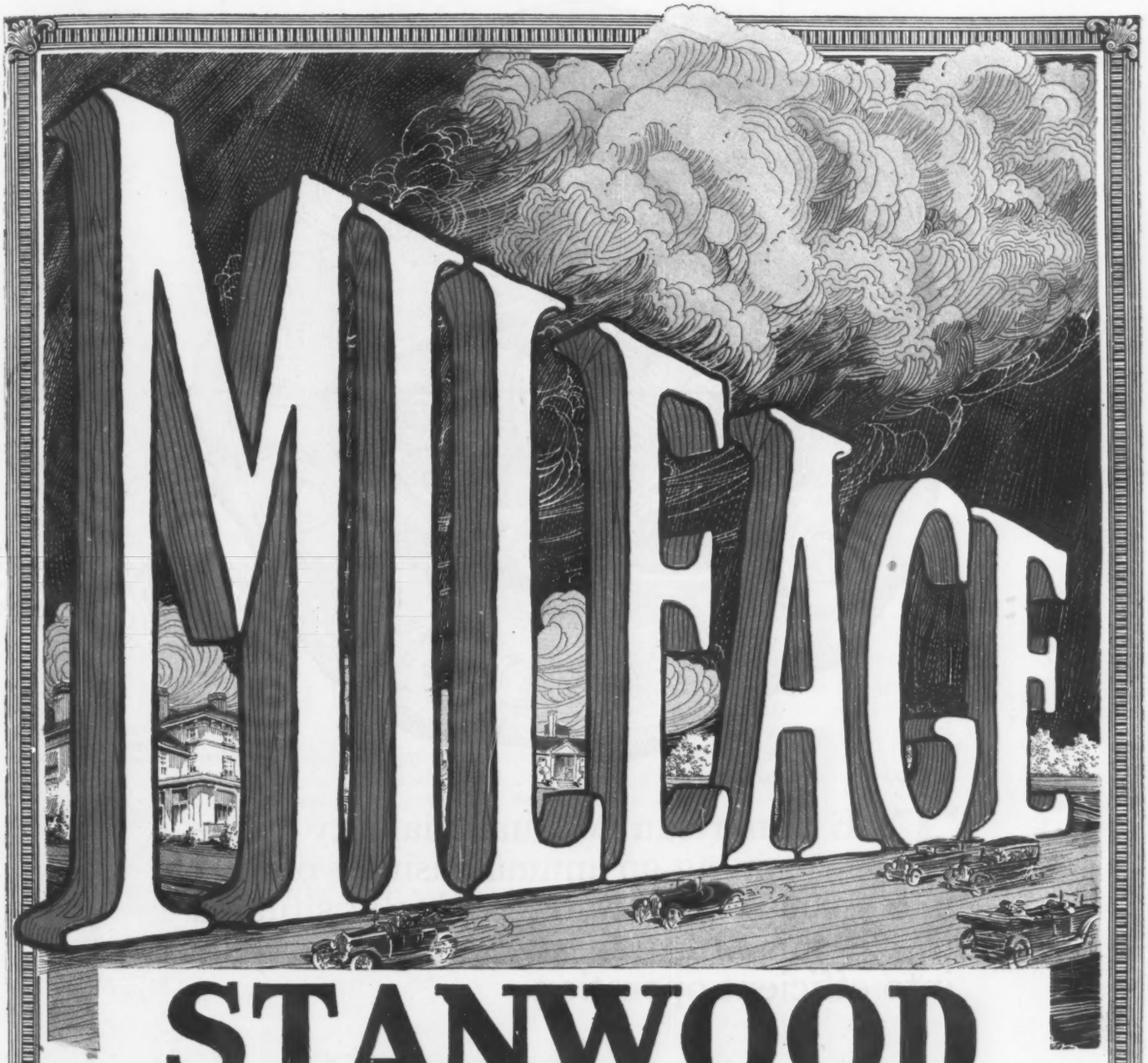
Wilson Tire & Accessory Co., Western New York and Western Pennsylvania, 747 Main St., Buffalo, N. Y.

Security Sales Corporation, Eastern New York, Northern New Jersey, Northern Illinois, Southern Wisconsin, 253 W. 58th St., New York, N. Y.

Security Auto Theft Signal Co., of Canada Limited, British Empire and Scandinavian countries and France, Dunnville, Ontario.

A. A. Ungar, Georgia, Florida, Alabama & Mississippi, 399 Peachtree St., Atlanta, Ga.

Herbert Kraft, Texas, 219 Main St., San Antonio, Texas.



STANWOOD
Cord Tires

Back of STANWOOD TIRES is a directing force of farseeing tire men with manufacturing experience as old as the industry.

Back of these is the definite policy to produce under the STANWOOD brand the supreme long distance tire—Cord, Fabric and Truck Pneumatic.

The STANWOOD contract with Distributors for 1920 is based upon this solid foundation. Territory is now being signed up. Applications promptly considered.

NOTE:—STANWOOD Supreme Quality Inner Tubes, Red and Gray, are built to the same standard of super-excellence.

STANWOOD RUBBER COMPANY
Executive Offices: 9 East Fortieth Street, New York City

Chicago Branch: 1712 So. Michigan Avenue
Factories: Elizabeth, N. J.

© 1919

1



THE American Mutual Liability Company, doing an annual business of over $7,500,000 in premiums, is ideally situated to put this "Insured at the Factory" plan into efficient operation.

AMERICAN LIABILITY INS

The Greatest Partn

HELPING THE DEALERS
Toward Bigger and Quicker Profits

In 1920, and the years that follow, the conditions of supply and demand will be different from the conditions during 1918 and 1919 when the "sellers' market" resulted in a distinct car shortage with demand far beyond the ability of manufacturer and dealer to supply.

Estimated production for 1920 is 2,250,000 cars and trucks. There will be a supply sufficient to take care of the demand.

Result: Competition among dealers will assert itself.

Sales will be more quickly realized by those dealers who can not only deliver good cars and good service but who can also tell the prospective purchaser:

> *"The manufacturer has covered this car with liability insurance for a term of twelve months. You are permitted to enjoy this protection from the moment you take delivery."*

Dealers can quickly appreciate what a big sales advantage this will be. In many cases it will prove the determining factor as between "Sale" and "No Sale."

Another big advantage from the dealer's viewpoint is that every car that comes to him from the factory will be fully covered by liability insurance from the moment it leaves the factory shipping room.

We believe the general adoption by the manufacturers of this plan for protection will prove one of the biggest advantages, to the dealers and to the consumer, that the Trade has seen for many a year.

In due course the progressive manufacturers — those who not only study how to make good cars but also how to successfully market good cars—will adopt the AMERICAN MUTUAL PLAN.

Will your cars be the product of such *progressive* manufacturers?

We would welcome the opportunity of telling every car dealer all the details of the plan. Aggressive dealers everywhere should be interested. If you are such a dealer and want the facts

WRITE TO

THE AMERICAN MUTUAL LIABILITY COMPANY,

HOME OFFICE: BOSTON, MASS.

MUTUAL
URANCE CO.

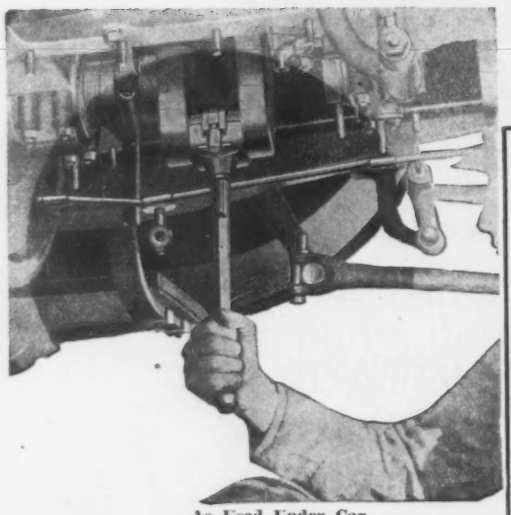
ership in the World

Do you know the HALEE Crank Shaft Reamer Is the Greatest Labor Saver in the Automobile Service Industry?

SAME RADIUS AS BEARING INSURES ACCURACY

GREAT STRENGTH AND RIGIDITY





As Used Under Car


THE WHITE COMPANY
MOTOR CARS AND TRUCKS



As Used on Bench Work

FOUR YEARS OF HARD SERVICE HAS ESTABLISHED ITS REPUTATION

The entire construction of the HALEE Crank Shaft Reamer is of great strength and rigidity; there are no weak parts to spring out of alignment; it is practically fool proof and the operation and use a simple matter to true up badly worn or out of round crank shaft bearings and fillet. With it you can remove as much or as little of the bearing as desired. With the HALEE Crank Shaft Reamer is furnished the HALEE Polishing Tool, which imparts to the bearing a mirror-like finish.

For automobiles, trucks and tractors $60, $75 and $90 according to size.

Your orders and inquiries solicited. Live jobbers communicate with us.

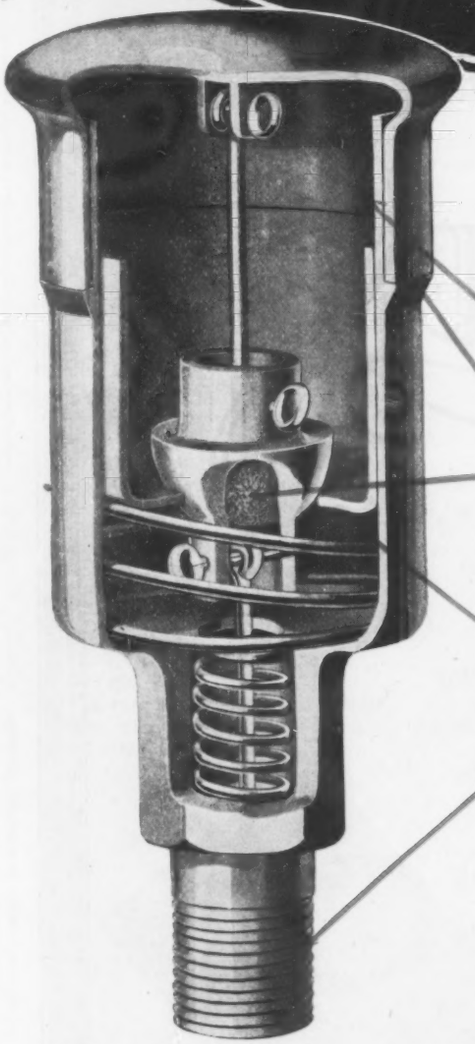
THE H. A. LEE TOOL AND MFG. COMPANY

1505-7-9 McGEE St.,
KANSAS CITY, MO.

Features of The Felix Oil Cup

A Combined Pressure and Automatic Feed

IMPORTANT INFORMATION for JOBBERS, DEALERS AND MANUFACTURERS



LOOK at this illustration and the accompanying explanation and you will understand why the Felix Oil Cup is pronounced the most efficient and most satisfactory method of lubricating a car or truck chassis.

NO THREADS TO CROSS

This common fault of the ordinary grease cup has been done away with.

NO COVER TO UNSCREW AND FALL INTO DIRT

This feature will be welcomed by every driver.

AUTOMATIC AND CONSTANT LUBRICATION

When the cup is filled sufficient oil filters through the membrane to keep the shackle bolt or other part lubricated ALL THE TIME. Unlike grease, which becomes packed on either side of the bolt and leaves the top and bottom to wear through lack of lubrication, oil immediately covers the entire bolt.

250 LBS. PRESSURE FLUSHES OUT DIRT AND GRIT

By simply lifting the cap and pressing with the thumb, the oil is forced over the bearing surface under pressure up to 250 lbs. if necessary to flush out all dirt and grit. This keeps the bearing clean and eliminates wear.

STANDARD THREADS TO FIT PRACTICALLY ALL CARS

Made in standard 1/8" pipe threads which fit about 75% of all cars.

SPEED AND CLEANLINESS

The Felix Cup is filled from an ordinary oil can in a few seconds. It is not necessary to even soil the hands.

ATTRACTIVE APPEARANCE

The cup is heavily nickel plated and highly polished. In appearance it compares favorably with the hardware on the instrument board.

HIGH GRADE MECHANICAL WORK THROUGHOUT

All dies have been accurately machined to conform to the minutest fraction of an inch. Each cup is assembled by hand which assures accurate fitting of all parts.

JOBBERS—DEALERS

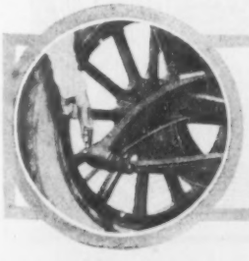
Felix Cups are sold through recognized jobbers.

JOBBERS:—Write for our proposition.

DEALERS:—If your jobber cannot supply you, write to us.

THE FELIX MFG. COMPANY

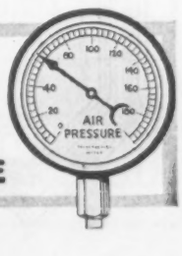
4437 N. Clark Street CHICAGO, U. S. A.



A PUSH of the THUMB

FLUSHES OUT DIRT and GRIT

UNDER 250 LBS. PRESSURE



Announcing

America's most Distinguished Car

The

Murray

THE arrival of the new Murray places on record a conspicuous achievement in motor car designing.

A new creation mechanically. A new creation externally — *artistically* — displaying the art of body making in its supreme moments of inspiration.

There are limited number of territorial assignments to make and Mr. Geo. O. Starr, Manager of Sales, will be glad to consider applications from a few representative dealers.

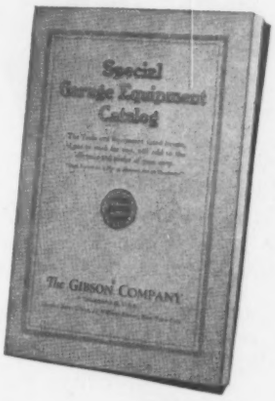
Murray Motor Car Co.

General Offices, Niagara Bldg. NEWARK, N. J.

MURRAY

"GIBSON SERVES THE WORLD"

AUTOMOTIVE EQUIPMENT



Garage Owners

This is the age of machinery. Setting the pace, we now have the most complete line of standard garage equipment in the country. Everything has been thoroughly tested by practical mechanics.

Good equipment is an investment that brings daily returns. Every piece of machinery and every tool that we handle saves time, makes labor more efficient, enables you to render better service to your patrons for less money and make bigger profits for yourself.

A model shop equipped with this machinery has been installed in our building for your benefit. Let us demonstrate its usefulness to you.

You should consult our Engineers about your needs. Advise us the kind of service you want to render, giving a rough sketch of your floor plan, and we will be glad to send you a detailed drawing with the best equipment properly arranged for your work with prices applying. Catalog No. 51 fully describes the line.

Tire Service Stations



Repairing tires has become a profession. The field is large and there is room for you in any good location. Take advantage of our Free Practical Course of Instruction with a diploma on completion.

Our line has been carefully selected and is very complete. We can furnish you with anything from a tube splicer to the complete equipment necessary to start up a modern Tire Service Station.

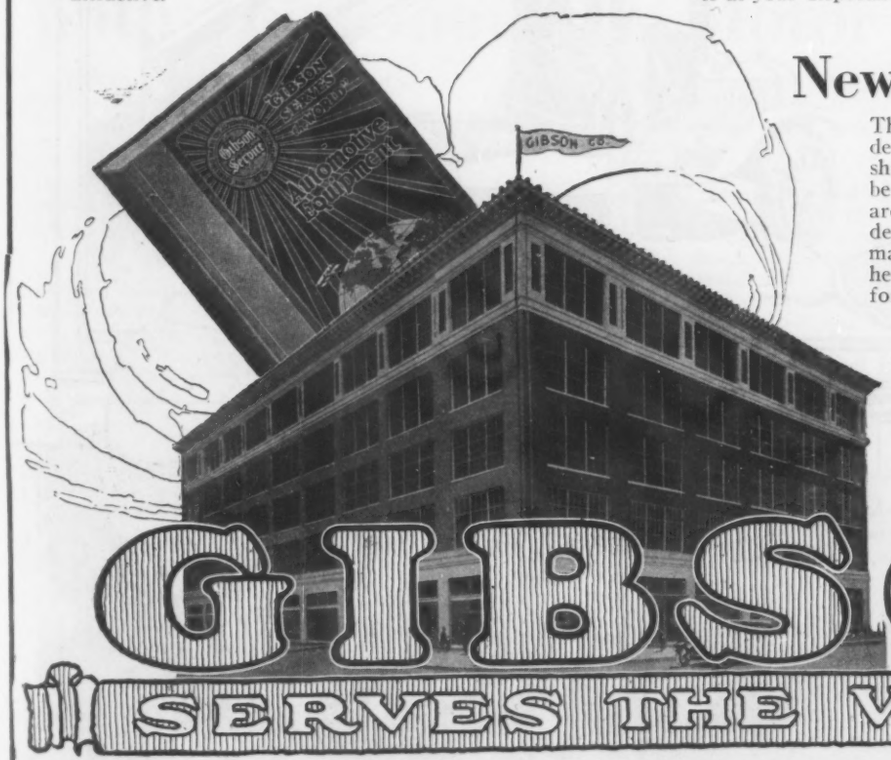
Increased production of pleasure cars and the rapidly increasing use of pneumatic truck tires insure the biggest year in history. This means that your profits can be more than doubled if you have the proper equipment to meet the demand.

Let us put you in a position to repair any tire. We carry all the necessary machinery, tools and materials—and in every case the best that can be found for the money. Ask for our Tire Repair Equipment Catalog No. 52.

Electrical Equipment

As distributors for General Electric Motors, we carry one of the largest stocks in the country. We have all sizes. With the present shortage, prompt shipment should be very attractive.

Our Battery Service Station equipment is complete. It includes the General Electric and Wotton lines of charging apparatus. The long experience of our Electrical Engineer is at your disposal.



New General Catalog

The Gibson stock is illustrated and described in the new big catalog, which shows over 22,000 items. This book will be ready for mailing on March first. We are glad to furnish copies free to *bona fide* dealers everywhere. If you are not on our mailing list, write us on your own letterhead, indicating your line of business. Ask for Catalog No. 53.

The Gibson Company

General Offices: Indianapolis, U. S. A.

Export Sales Office
27 William St., New York City

GIBSON

SERVES THE WORLD

"It works like lightning!

That's why it's called the

COLUMBIAN

LIGHTNING HOIST"

The first requisite and the most necessary feature for a Hoist to possess is SPEED. Columbian dealers and motor truck distributors who sell Columbian Hoists actually demonstrate its superiority in this respect by showing prospects the Hoist in action. Truck operators quickly appreciate this distinctive and important feature.

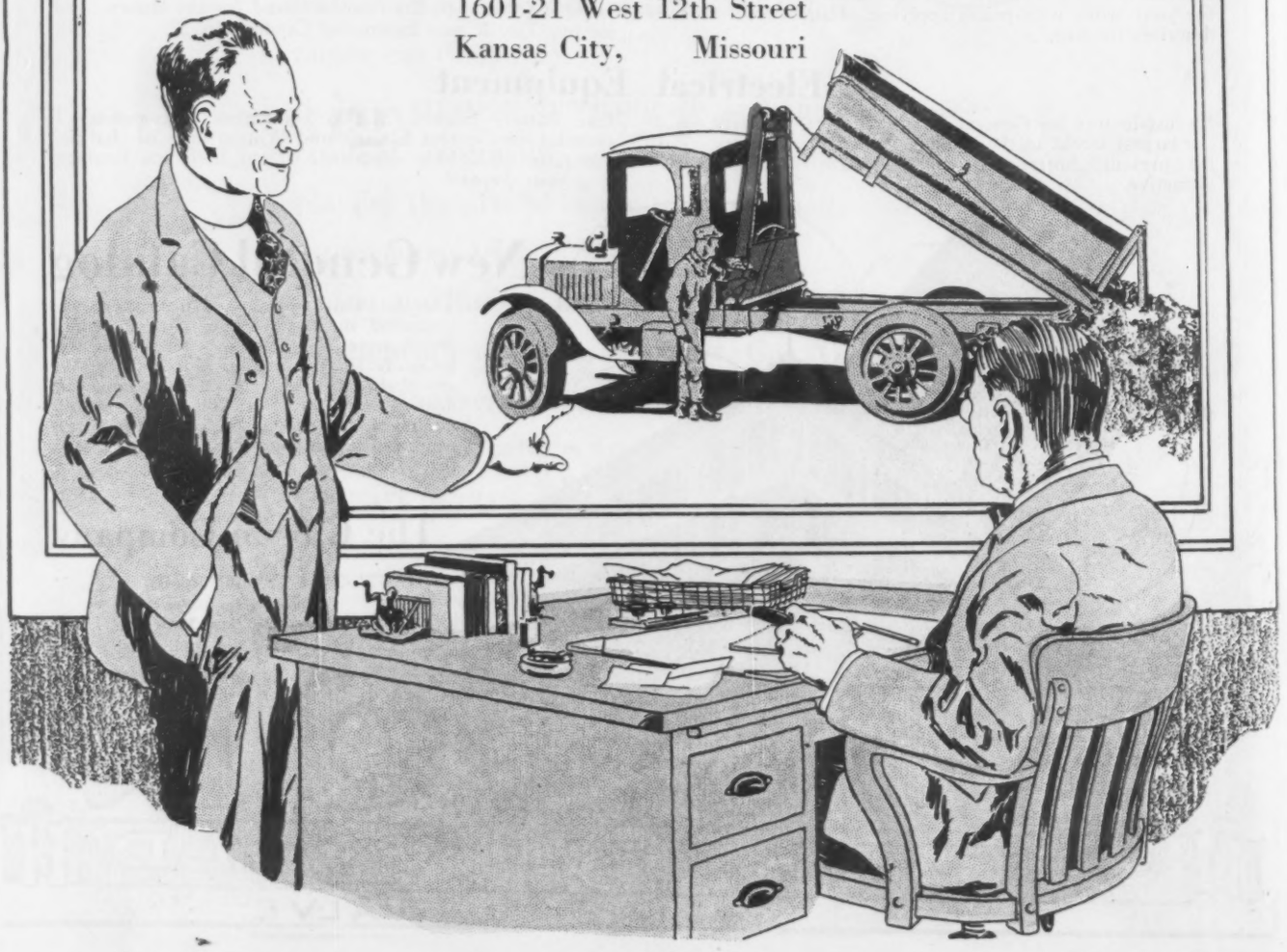
It fits any chassis; is most advanced in its design; occupies but little space and handles with ease loads from one to five tons with but ONE man at the crank. It is of the lightest weight consistent with proper strength, allowing for a dump body of larger carrying capacity.

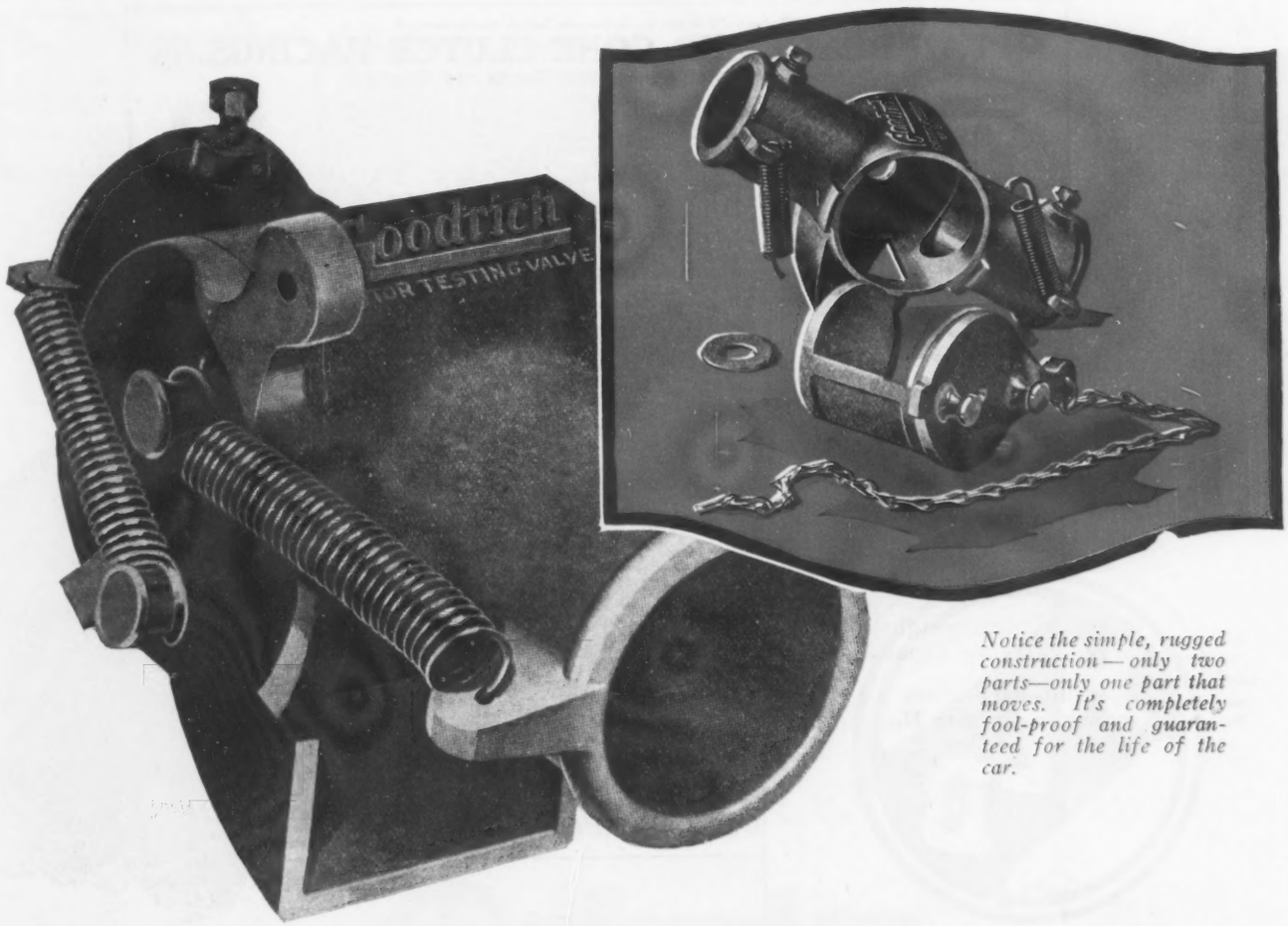
For full particulars about this superior HAND HOIST FOR DUMP BODIES, write for circular No. 74.

COLUMBIAN STEEL TANK CO.

"Tanks for the World"

1601-21 West 12th Street
Kansas City, Missouri





Notice the simple, rugged construction — only two parts—only one part that moves. It's completely fool-proof and guaranteed for the life of the car.

It's Easy to Tell a Lagging Motor With the Goodrich Motor Testing Valve

A missing cylinder steals gas and digs deep into the pocketbook.
Many motorists have discovered how to stop this unnecessary expense by testing their motor before they drive the car.
They have found a simple time saving method which shows the exact condition of the engine.

No Guess Work

You, too, can detect a missing cylinder instantly without moving from the driver's seat with the Goodrich Motor Testing Valve. Then your motor can have no secrets from you.

The Goodrich Motor Testing Valve distinctly reproduces every pulsation of the engine and instantly reveals any irregularity.

How the Test Is Made

The bell mouth opening of the Goodrich Motor Testing Valve produces a loud, clear, sharp note and allows for ample expansion of the gases, relieves the motor of all back pressure and greatly intensifies the sound of each explosion. It is so simply constructed, so strong, so easily installed, so impervious to hard knocks, and adverse conditions—that it is indispensable on all cars whose drivers want to know at all times how their engines are performing.
Guaranteed to last the life of the car without sticking, slowing up, carbonizing or giving trouble of any kind.

Cuts Gasoline Bills

The Goodrich Motor Testing Valve will pay for itself in one month by saving gasoline wasted on a missing cylinder.
Dealers Everywhere are selling more Goodrich Motor Testing Valves each month. If you are not selling your share ask your jobber—or write us.
Made in 15 sizes for all makes of cars and trucks. Ask for booklet.

Showing motor-testing valve open. Bell-shaped mouth produces far louder noise than ordinary cut-out. Positive and instant relief from back pressure.

Goodrich-Lenhart Mfg. Co.
36 PINE ST. HAMBURG, PA.

Showing motor-testing valve closed. Revolving shutter with knife edge absolutely prevents carbon trouble.



Goodrich
MOTOR TESTING VALVE



Hide Leather & Belting Co., Indianapolis, Indiana, Manufacturers of

FAN BELTS AND CONE CLUTCH FACINGS

for all Makes of Automobiles, Trucks and Tractors



Three Types of Belts



Wetprufe A flat fan belt of highest quality. Made of carefully selected oak tanned grain leather, the best obtainable for fan belt use. Waterproof, oil proof and heat proof. Joints are made either plain or stitched. Also in handy rolls.



Solid "V" Shaped Belt

Vee Sol made of two plies of Wetprufe leather solidly cemented and either braided or sewed through center. Made in endless belts or in rolls.



Vee Lug A "V" shaped, lug type belt, made of best grade belting leather, with lugs strongly riveted on. Comes in endless belts and rolls.

Send for samples and prices on these Belts.

Sell More Fan Belts With This Chart

It gives complete data on HLB Fan Belts and Cone Clutch facings for over 300 models of cars, trucks and tractors. It was produced by our engineers and is based on authentic blueprints and specifications.

With this chart it is easy to sell customers the HLB Fan Belt that exactly fits their car, truck or tractor. Most of the belts listed on the chart will serve two or more MAKES of cars; and in many cases will fit a number of MODELS of each make.

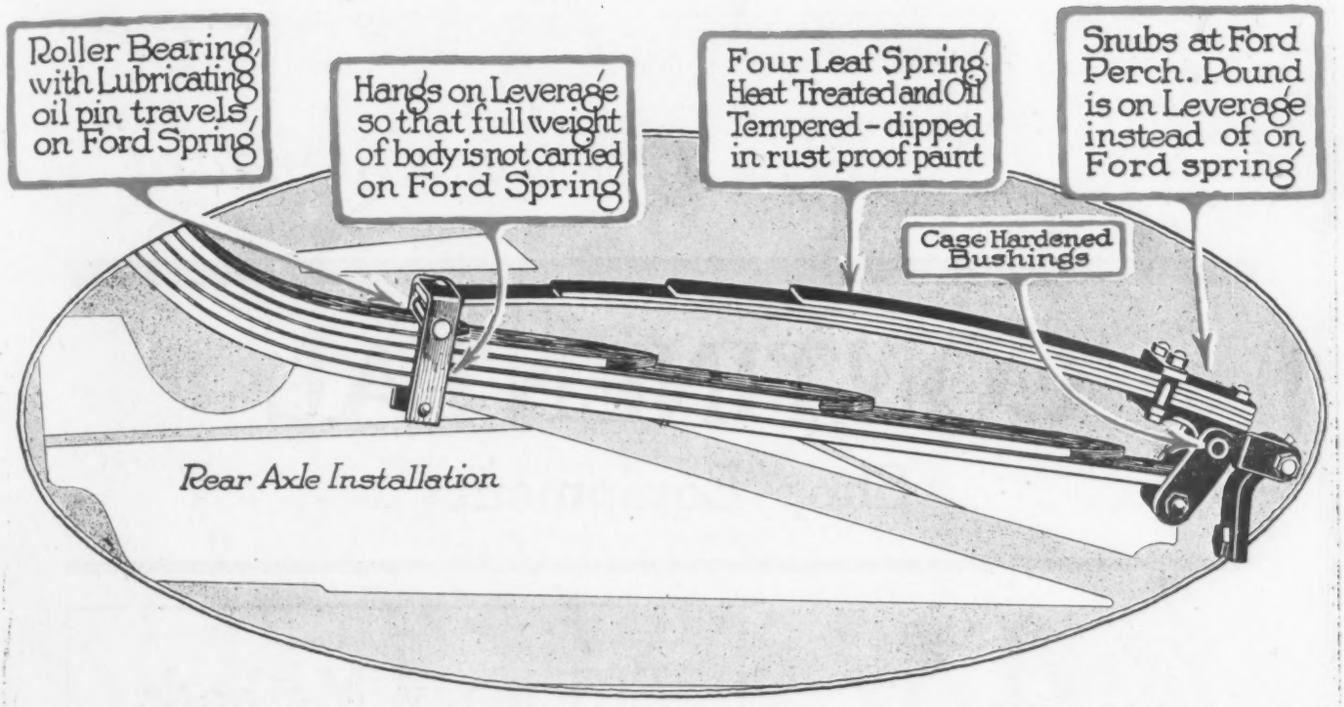
One section of the chart shows groups of cars which use the same belt, thus enabling you to quickly select and stock about fifteen leading HLB Belts and handle practically all the belt replacement business in your territory.

The chart also gives complete data, showing the make and models of truck, car or tractor that each HLB Lethertex Cone Clutch Facing will fit. This feature is extremely valuable and profitable.

This Chart is free to all jobbers and dealers. Be sure you get one—write us today.

HIDE LEATHER & BELTING CO.

Indianapolis, U. S. A.



STUDY THE CONSTRUCTION AND OPERATING PRINCIPLES OF THE

Defender Shock Absorber

DEFENDER Shock Absorbers have proved to dealers that they outsell every other type of shock absorber on the market for Ford cars.

And what's more, they stay sold. Figures show that they sell so well that dealers not only re-order over and over again, but in constantly increasing quantities.

The spring in the fishing rod absorbs the quick, powerful strike of the mighty fish and subdues the shock which otherwise would easily sever the dainty silk line.



SAME PRINCIPLE AS FULL ELLIPTIC SPRING

One spring works against the other. This construction positively absorbs all shock and prevents the Ford spring from breaking or becoming flattened. The roller bearing operates laterally on the Ford spring and causes the shock absorber spring to subdue the slightest shock.

ADDS 3 FEET TO LENGTH OF FORD SPRING

With the ordinary shock absorber the full weight of the body is carried on the Ford Spring. With the DEFENDER construction, the body hangs on the leverage and provides a cradle suspension insuring extraordinary riding qualities.

SNUBS AGAINST FORD PERCH

Side-sway is reduced to a minimum and the pound is distributed on the leverage instead of on the Ford Spring. Many shock absorbers are so constructed that the pound at one place on the Ford Spring causes the spring to crystallize and break.

EASY TO INSTALL

DEFENDER Shock Absorbers do not raise the Ford body as high as other shock absorbers. They can be installed quickly and will last for years, because there is nothing to get out of order—or to adjust.

DEALERS—WRITE FOR TRIAL OFFER

Just try a set of these wonderful shock absorbers. If they do not live up to your expectations, return them at any time within 30 days at our expense.
See us at the CHICAGO SHOW—COLISEUM Basement, Sections 31-32.

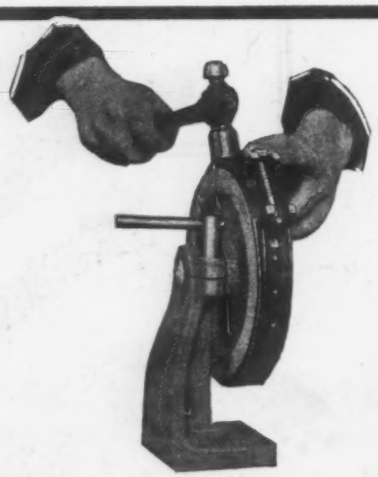
DEFENDER AUTO LOCK CO.

5th Floor, Marquette Bldg., DETROIT, MICHIGAN

The Efficiency Standard

CONTINENTAL

Shop Equipment

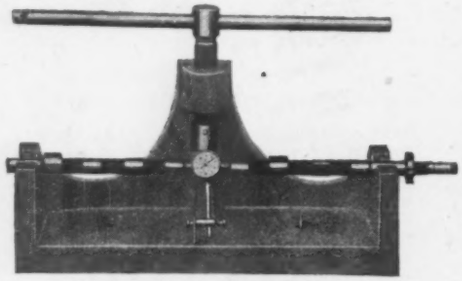


Continental Riveting

The band is placed around the mandrel and drawn tight wiht a clamp bolt. Old rivets are easily cut off with a cold chisel. The jig may be revolved and locked firmly in position most convenient for driving in new rivets. This tool will pay for itself in no time.

Efficiency Methods Increase Profits

Continental Shop and Factory Equipment lowers overhead costs—enables you to do better work and charge your customers less. There is a Continental time and labor saving device for every important garage and repair shop operation. The line includes: Stands for Motors, Axles, Batteries, Radiators, Welding and Assembly Tables, Creepers, Industrial and Wrecking Trucks, bushing Presses, Crank and Cam Shaft Straightening Presses, Riveting Jigs, Piston Aligning Devices, Piston Vises, etc.



Continental Crank and Cam Shaft Straightening Press

Shafts are mounted on V blocks. A dial indicator tells you to a thousandth of an inch how far the shaft is out of true and how far to throw it back with the hand lever and screw. This tool puts a stop to the comebacks.

Continental Motor Stand

This Universal type Motor Stand is so well known and so generally used that little need be said about it. With it the motor may be locked in 35 different positions and completely revolved to bring any part to the most convenient position for the repair man. This Stand was picked by the Government to handle the famous Liberty Motor.



Ask your jobber or write for catalog

CONTINENTAL AUTO PARTS COMPANY

1802 E. 17th St., COLUMBUS, IND., U. S. A.

The Exclusive Impregnating Process Does the Trick

VIKING BRAKE LINING

Is Giving More Satisfaction, Eliminating More Vibration and Strains, and is creating more sales simply because it is MADE ONLY FOR FORDS.

VIKING is constructed with a long, compact weave of the toughest fabric and thoroughly impregnated to give constant service in hot oil.

It answers every Ford transmission requirement and is easier to sell to the Ford owner because there isn't another lining available that is impregnated by the Viking exclusive process to give a constant gripping surface and never wear off.

Think of the advantage of selling an exclusive Ford lining. No complaints of asbestos flaking off and clogging the drain. No more grouchy comebacks about fine wires wearing off and fouling the ignition.

Sell VIKING and cut out the expense of carrying several "substitute" linings.

A Lining Made Only for Fords—VIKING!

Get Viking discounts TODAY

VOGT MANUFACTURING CORP.
ROCHESTER, N. Y.

Reasons for VIKING

1—*Made exclusively for Fords.*
2—*Compactly woven fabric—greatest breaking surface.*
3—*No wire or compound to "short" ignition system.*
4—*Treated to innermost thread.*
5—*Made to run in hot oil.*
6—*Does not glaze, swell or become mushy.*
7—*Eliminates jerking and bucking.*
8—*Gripping power certain at all times.*
9—*Permits smooth application of brakes.*
10—*Greater durability.*



VIKING BRAKE LINING *Exclusively for Fords*

Sold in sets of three strips, with rivets, at **$1.50**

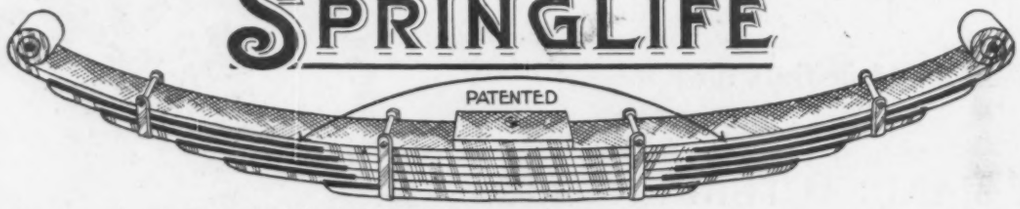


The Biggest Reason for Sending that Coupon

Sales are as certain as sunrise. The unconditional guarantee under which we sell "Springlife," and under which YOU can sell it, is a "talking point" that always wins. Read it again—could anything be more convincing? Even your most skeptical prospect is bound to at least try "Springlife" under those conditions.

This broad, strong guarantee stands back of our claims that

SPRINGLIFE



makes any car ride much easier, eliminates all spring squeaks, prevents spring breakage, and saves tires, by assuring PERFECT SPRING LUBRICATION. These wonderful qualities alone make "Springlife" an easy, sure seller—backed by our guarantee they absolutely clinch sales and assure a successful, profitable business for you.

"Springlife" is now widely recommended and sold by authorized motor car agents in various cities. We want representatives selling "Springlife" in EVERY city—and they MUST be authorized motor car agents.

If you sell any make of motor car you can sell "Springlife." And to give you the chance to prove for yourself its wonderful qualities and selling possibilities, we will send you, ABSOLUTELY FREE, a "Springlife" filling for a 30-days' trial in your personal car.

Read the coupon—fill it in—mail it. You'll be glad you did.

Merrill-Hamilton Co. Sole Mfrs.
Kansas City Missouri

Authorized Motor Car Agents: SEND NO MONEY. Fill in the coupon, use "Springlife" in your car for thirty days. If absolutely satisfied send us check for $12.00 (Fords, $5.00); if not satisfied you don't owe us one penny.

MERRILL-HAMILTON CO., DEPT. A.
Southwest Blvd. & Central St.,
Kansas City, Missouri.

You may send me a trial filling of "Springlife" for my car. At the end of 30 days I will either send you my check for $12.00 (Fords $5.00) or tell you why I am not satisfied.

Name .....
Address ..... State .....
City ..... Model .....
Make of car .....
Car you sell .....



Sell Your Customers One of the Beats-All Products to Renew Their Cars



MOHAIR TOP DRESSING

Will give the shabby, leaky, weatherbeaten top that new appearance and durability. It Re-Dyes, Weatherproofs and Re-Rubberizes the fabric, leaving it soft and pliable.

Pints $0.85
Quarts 1.50



KNU-LACK TOP DRESSING

Adapted especially for Ford and all imitation leather tops — giving that rich, glossy black finish. It waterproofs, re-rubberizes, preserves the material, retaining its softness and pliability.

Pints $0.75
Quarts 1.35

Beats-All Brand incorporates into its Top Dressings a LIQUID RUBBER, which guarantees its waterproofing and re-rubberizing qualities.

If the top is shabby and leaky it can be restored to its original appearance and made weatherproof by a coat of Beats-All Top Dressing. It puts back into the fabric something of the elasticity which has gone out through deterioration.

The faded and stained top lining can be made to look like new by re-dying it with Beats-All Black or Drab Lining Dye. It covers all stains and discolorations.



DULL-LAC TOP DRESSING

For all Leather and Pantasote tops. It waterproofs and rerubberizes, softens and preserves the material, giving it that rich egg shell non-gloss finish.

Pints $0.85
Quarts 1.50



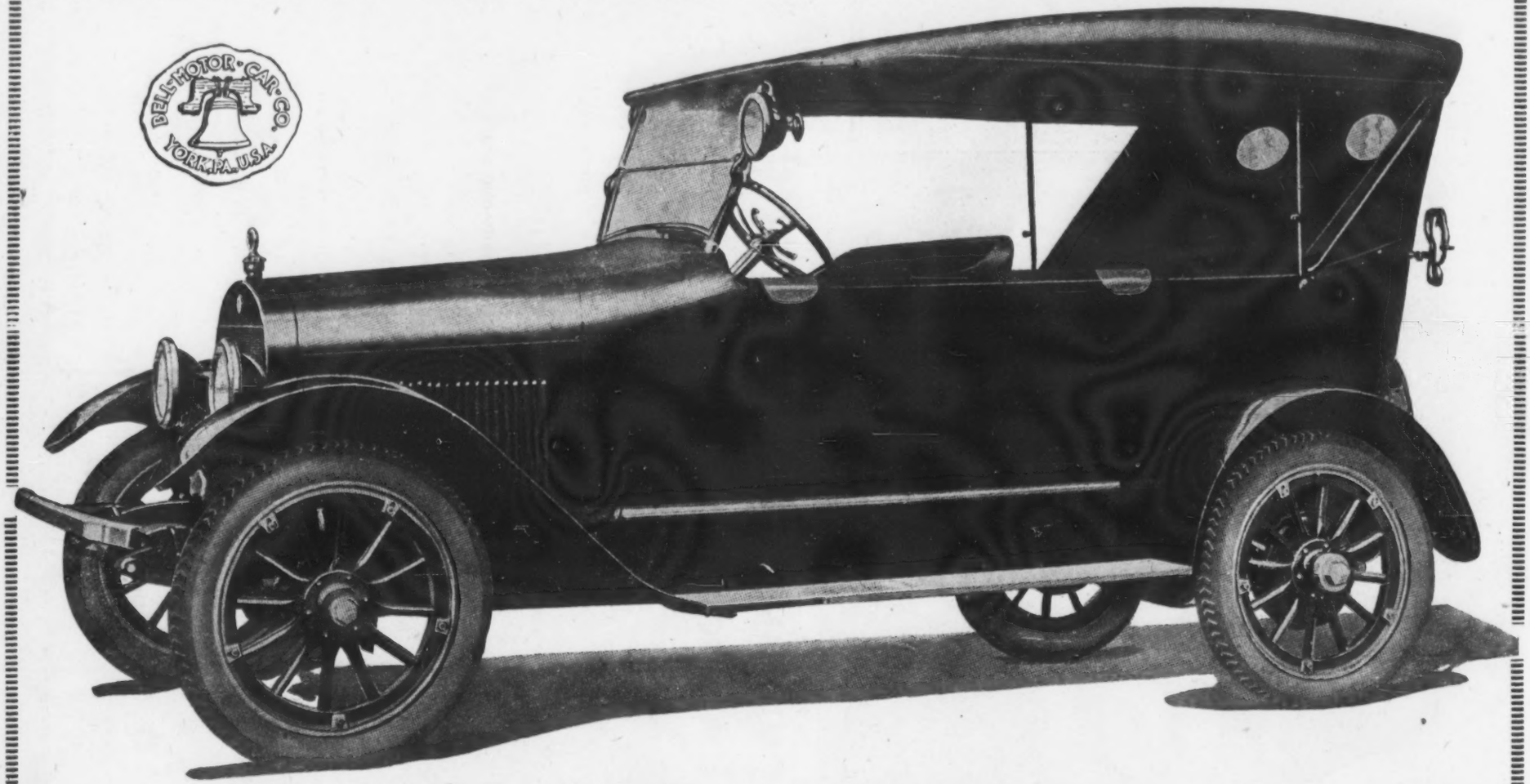
DRAB LINING DYE

It re-dyes and re-finishes the inside top lining a fast light color, giving it that fresh and new appearance. Covers all stains and discolorations.

Pints $1.35
Quarts 2.50

AUTO SPECIALTIES MFG. CO.

40 Elm St., Buffalo, New York

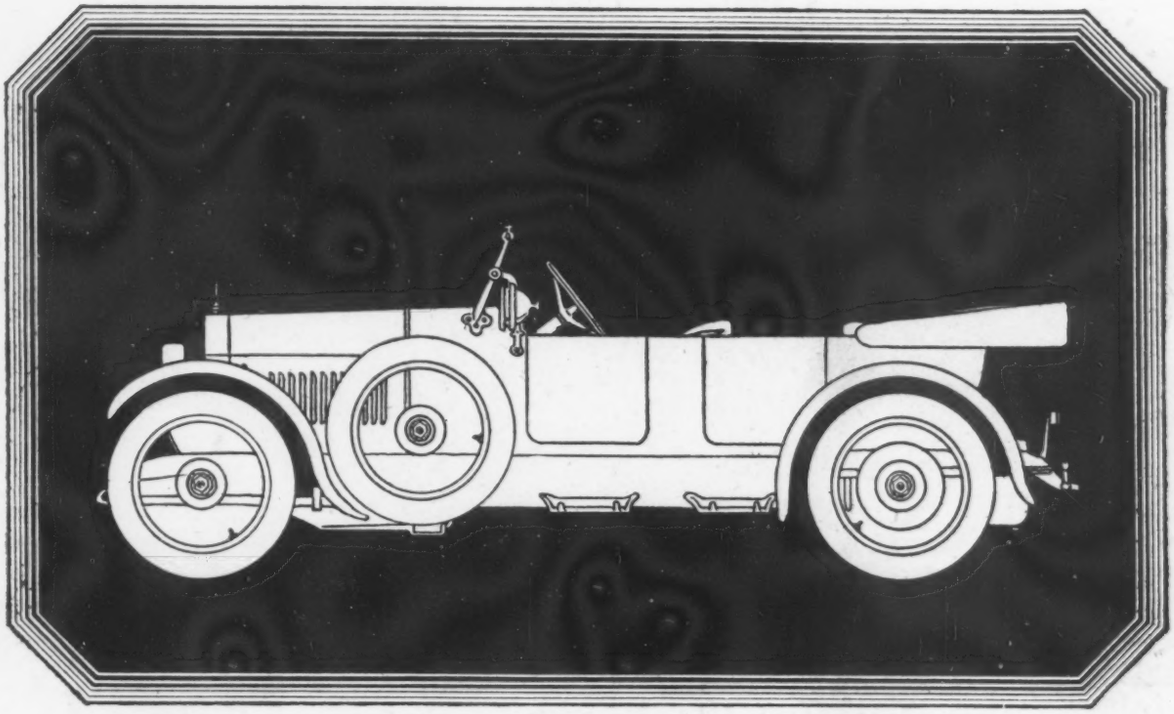


The 1920 Bell Four

Speaking of Bell economy—the Bell Car averages 20 to 24 miles on a gallon of gas—and 7,000 to 9,000 miles from tires. The Bell is a car of Standard Parts.

Write for our liberal, straight-from-the-shoulder dealer proposition, as well as territorial details

Bell Motor Car Company, York, Pa. **Export Dept., 100 Broad St., New York**



H. C. S. SPECIAL

APPRECIATION spoken in words costs little. But favorable comment or appreciation that comes in an avalanche of tangible business must signify buying confidence. At the National Shows this kind of "appreciation" exceeded even our own expectations.

This splendid tribute to the twenty-one years of engineering and manufacturing experience of Harry C. Stutz is only another indication that today people want in a car exactly what is offered in the new H. C. S. Special—a conservative motor car of indisputable distinctiveness and smartness with economical operation as its basic principle.

Literature will be ready for mailing February 15th.

FOUR-PASSENGER

H. C. S. Special, 120" wheelbase, Weidely bull-dog type motor designed and built especially for and used exclusively in H. C. S. motor cars—Lanchester vibration dampener—four-cylinder valve in head, 3 5/8" bore x 5 1/2" stroke, horsepower more than double S. A. E. rating.

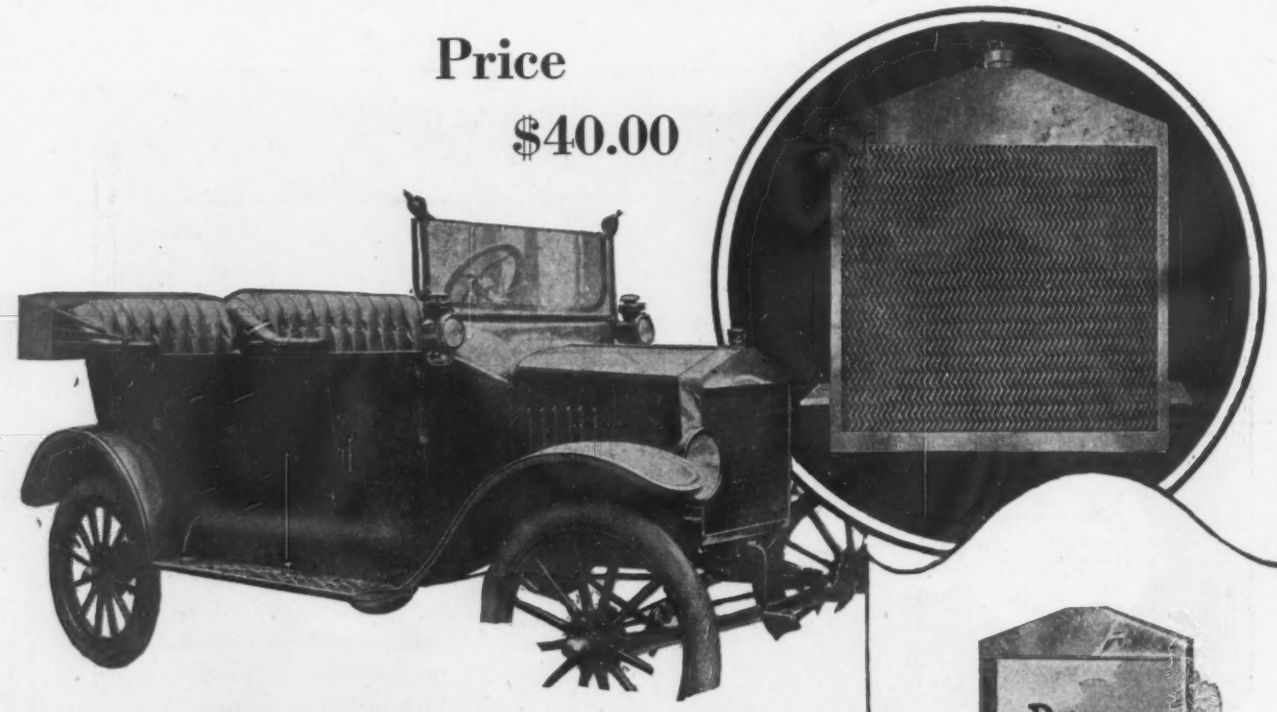
H SPECIAL S

H. C. S. MOTOR CAR COMPANY

HARRY C. STUTZ, President

INDIANAPOLIS, U. S. A.

Price $40.00



The Doric Radiator Has the Maximum Selling Appeal. Put One on a Ford Demonstrator and See How It Pulls Prospects.

THE wonderful success dealers have had in handling the Doric Radiator has shown that it has all the characteristics of a big seller. It has the appearance to command attention and it has the quality to sell and keep sold.

Ford owners buy the Doric Radiator because it appeals to their eye for beauty, because it is of the fashionable and distinctive Rolls-Royce type and because it gives them just what they want to make their cars different from the ordinary run of Fords. Besides this it gives them a more efficient, more substantial radiator, one that will save them money on repairs.

Dealers and Jobbers: Write us and let us tell you about the Doric design and Doric construction. The Doric is listed at $40.00. We will give you a liberal proposition.

MOTOR TRUCK RADIATOR & MFG. CO.,
2-6 Columbus Circle, New York City



The Liberty Shell—made to replace the standard Ford shell, retaining the original Ford core.

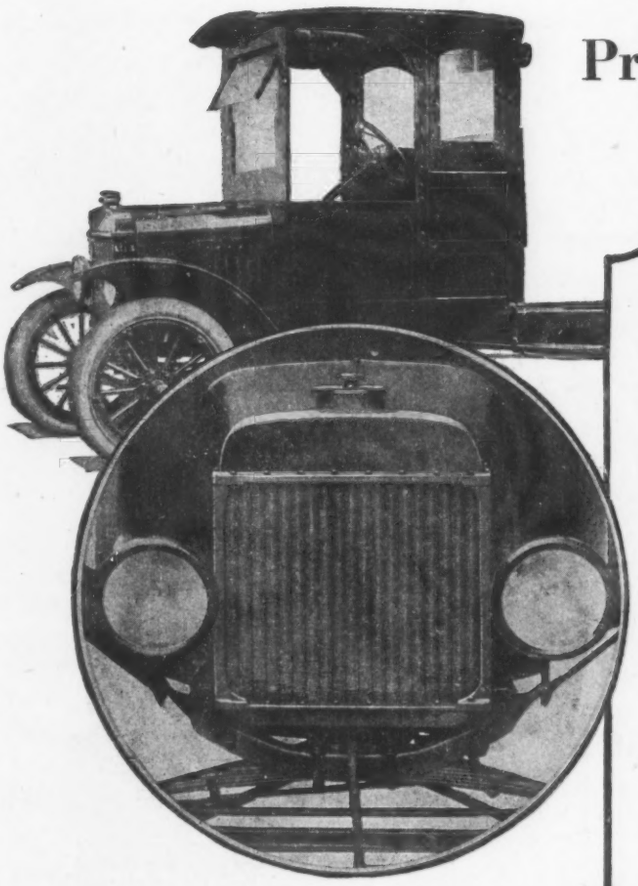
Identical in quality and beauty with the Doric Radiator shell. Solid Liberty silver alloy. No plating to wear off. Nothing to corrode.

The low price makes this a very popular proposition.

We can also supply the diagonal core used in our famous DORIC Radiator for use with the Liberty Shell.

LIBERTY SHELL
for FORD RADIATORS

DORIC Radiator for FORD CARS



Price
$50.00

The Best Proposition You Can Make to the Ford Truck Owner

Every Ford Truck needs an Emco Radiator. It needs it to get better service out of its engine. It needs it to save wasting time in the repair shop.

The Emco Radiator is built to keep the Ford engine cool under the severe demands of truck service. It prevents boiling with the heaviest loads, on the steepest grades and in the hottest weather. With an Emco a Ford does more work with less wear and tear on the engine.

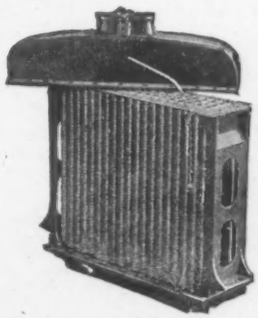
The Emco is built to resist leaks and damage. The tubes are of heavy gage, seamless drawn copper, strong enough to resist the effects of freezing. The tanks and frame are of malleable, practically indestructible. The Emco has the quality to outlast two trucks.

In fact, it is the biggest economy that can be put on a Ford Truck and the big way in which it is selling proves that Ford owners are realizing this fact.

It will pay you to write us at once for information and terms. List Price $50.00.



Rear view of the Emco (Ford Type) Radiator. Note the strength and compactness of its construction. It is a real truck radiator in every respect.



Top and bottom tanks are detachable. Core consists of 76 individual 3/8-inch tube with separate renewable pins. Tubes can be removed and replaced with a blow torch.

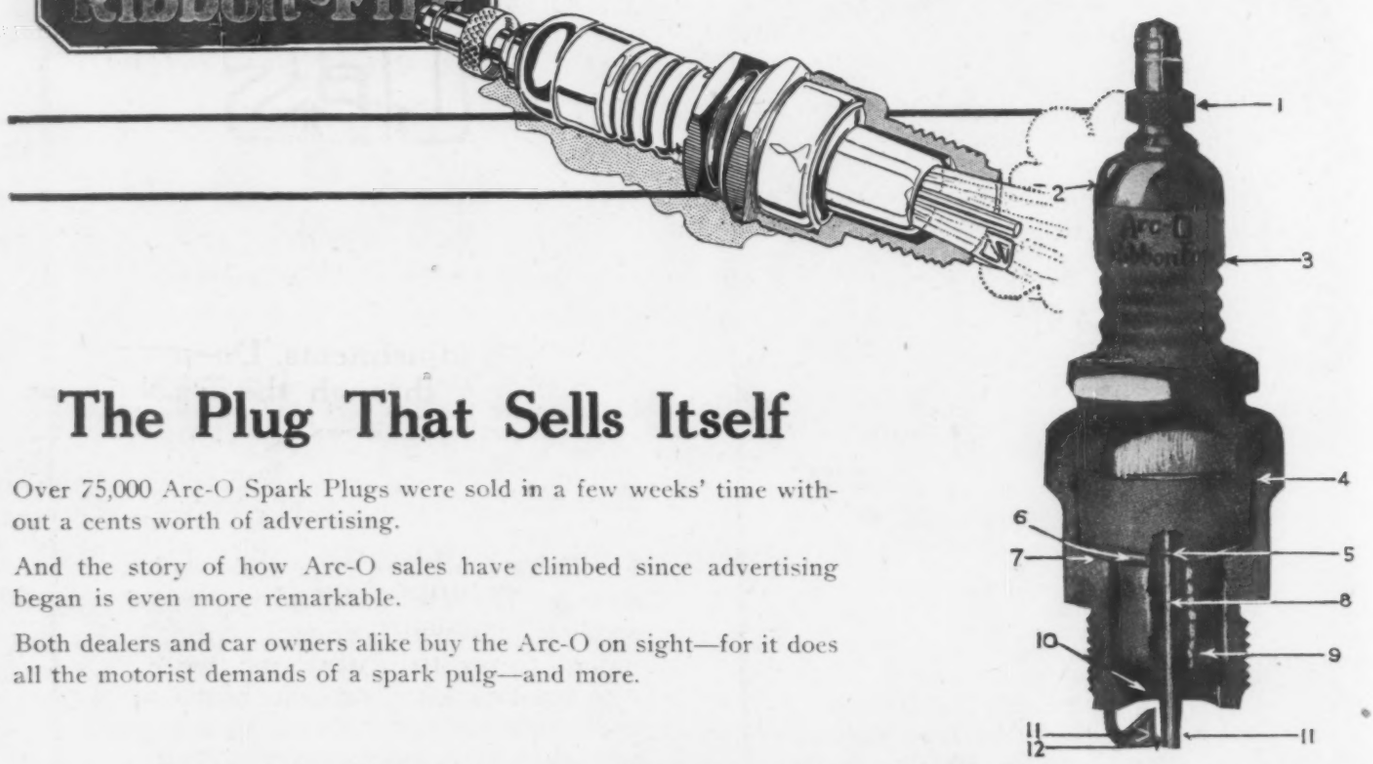
Motor Truck Radiator & Mfg. Co.

2-6 Columbus Circle, New York City

Manufacturers of the famous DORIC Radiator for Ford Passenger Cars.

EMCO Radiator for FORD TRUCKS





The Plug That Sells Itself

Over 75,000 Arc-O Spark Plugs were sold in a few weeks' time without a cents worth of advertising.

And the story of how Arc-O sales have climbed since advertising began is even more remarkable.

Both dealers and car owners alike buy the Arc-O on sight—for it does all the motorist demands of a spark pulg—and more.

These Twelve Features Eliminate Spark Plug Troubles

(Follow the numbers on cut to the right)

1. Knurled Nut; adaptable for all makes of terminals.

2. Brass Cap; mounted loosely on top of insulator for protection when socket wrenches are used. Also acts as a spring cushion for the center electrode when the knurled nut is tightened.

3. The very best grade of stone insulation of ample size. Impervious to oil, free from electrical leakage and carbon absorption.

4. A plain, copper, cone gasket, resting on a 45 degree tapered seat. This style of gasket will prevent leakage as well as sticking of the insulators when taken apart.

5. Asbestos packed against the shoulder of center electrode to act as a cushion and prevent leakage.

6. An oversized, copper, asbestos gasket. The size of this gasket allows us to dismantle the plug for inspection or cleaning any number of times without renewing the same.

7. The tapered seat in the shell allows forming of lower gasket, causing a double ridge to be set up which acts as a double seal and prevents any leakage.

8. An oversized center electrode of the very best material obtainable. This is asbestos wrapped and cemented in, under forty pounds of pressure.

9. A deep petticoat on the self-cleaning pistol barrel insulator to prevent fouling.

10. Counterbore in shell allows a large gas space around the petticoat.

11. Parallel electrodes — no impediment to cleaning effect of downward course of explosion.

12. Produces a sharp, blue, flat, wide rotating spark. This ribbon of fire cuts through the compression resistance like a knife, and completely explodes today's low grade gas.

The Arc-O Manufacturing Co., Inc., 2241 S. Wabash Ave., Chicago

To Jobbers and Dealers:

Send this coupon attached to your letterhead for attractive proposition.

.....

.....

Mail to Arc-O Mfg. Co.
2241 S. Wabash Ave., Chicago



To Car Owners:

(Money refunded if not entirely satisfied.) If your dealer cannot supply you with Arc-O Spark Plugs, enclose $1.25 for each plug and send this coupon.
Give name of car, truck or tractor, model and number of plugs desired. Name your nearest dealer.

Mail to Arc-O Mfg. Co.
2241 S. Wabash Ave., Chicago

TEN BROECK

THOROUGHBRED TYRES

8000 MILES

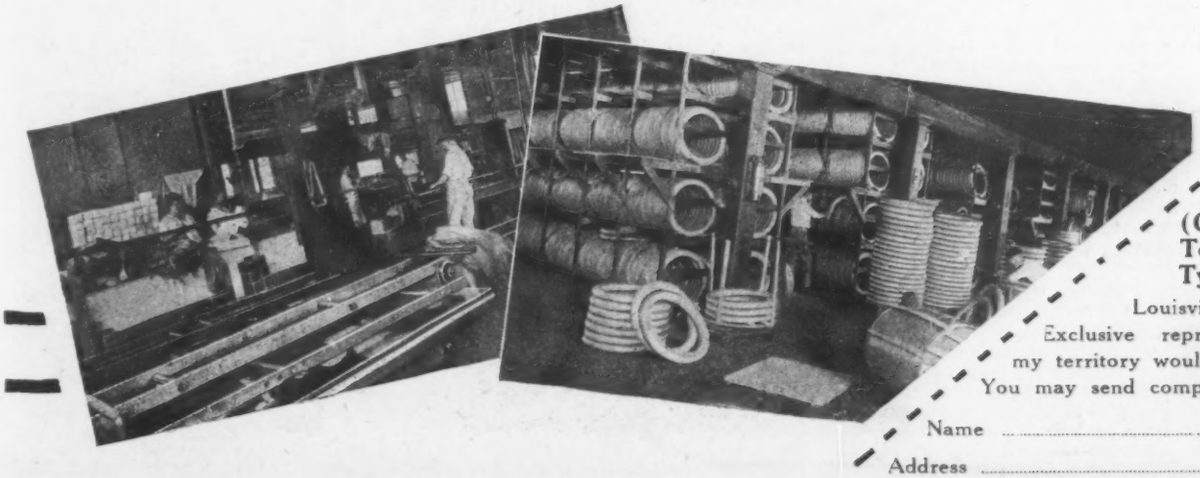
For **one** dealer in every locality throughout the country we have a selling plan based on exclusive representation—but the men we select will be men who can assume responsibilities and keep in step with the quickening march of a big idea.

TEN BROECK dealers themselves make all adjustments. Doesn't that indicate a strong vein of confidence running through the TEN BROECK organization? And doesn't it indicate clearly the type of men we wish to do business with?

TEN BROECK dealers are not left alone upon a sea of troublesome selling problems with a slap on the back and a hearty "go to it!" TEN BROECK dealers are part—and a mighty important part — of the TEN BROECK organization. Upon their measure of s u c c e s s hangs our chance of a winning race. With this in mind we back them up to the fullest extent—we give them the kind of cooperation that brings in the business and **holds it.**

If you are the TEN BROECK type of dealer—if the opportunities of a "no limit" selling plan are sharp and clear in your mind — then wire, telephone, write or come to the factory. If you're the man, we ought to get together.

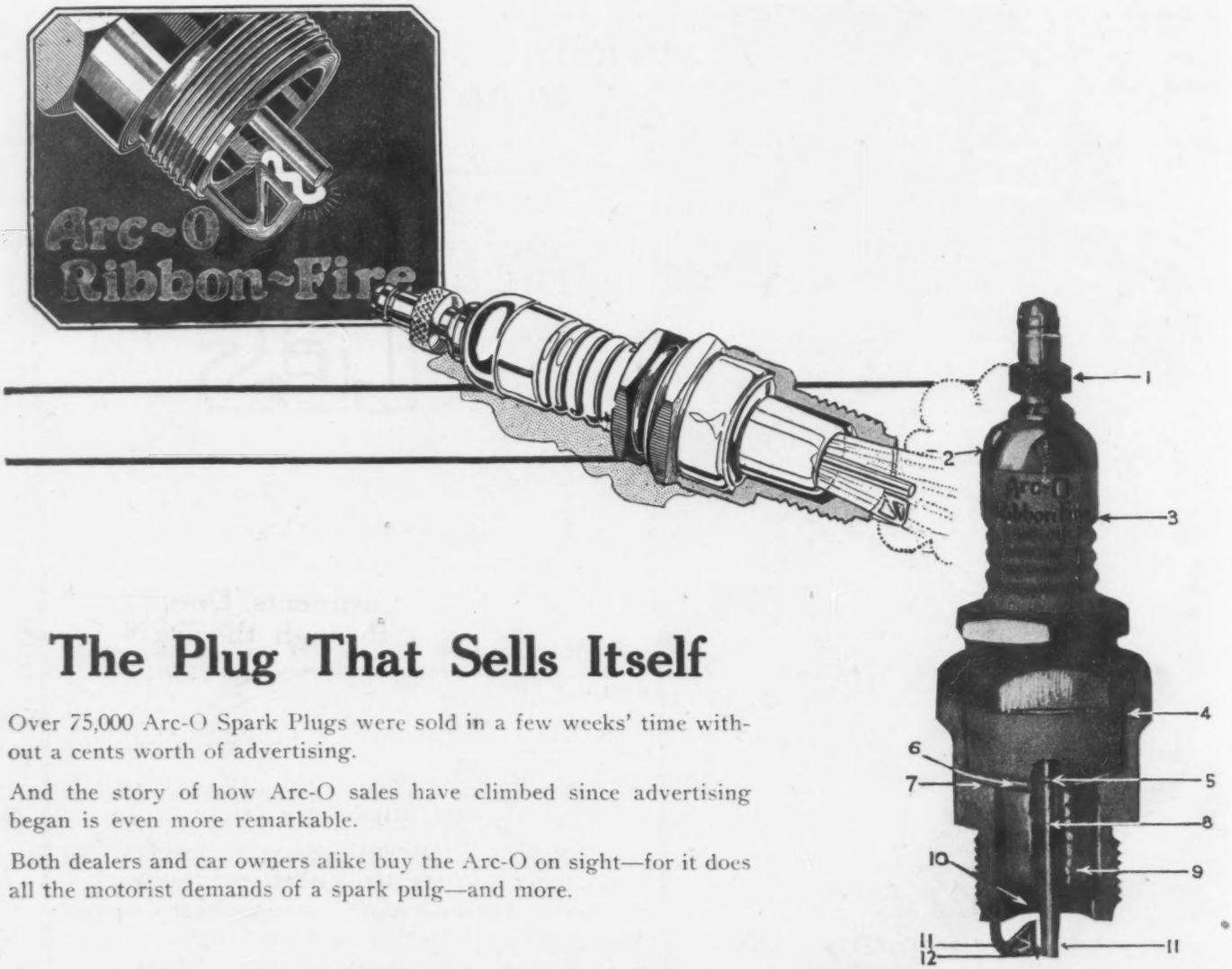
Ten Broeck Tyre Co.
Louisville, Kentucky



(COUPON)
Ten Broeck Tyre Co.
Louisville, Kentucky.
Exclusive representation in my territory would interest me. You may send complete details.

Name .....

Address .....



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And the story of how Arc-O sales have climbed since advertising began is even more remarkable.

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2241 S. Wabash Ave., Chicago

TEN BROECK

THOROUGHBRED TYRES

8000 MILES

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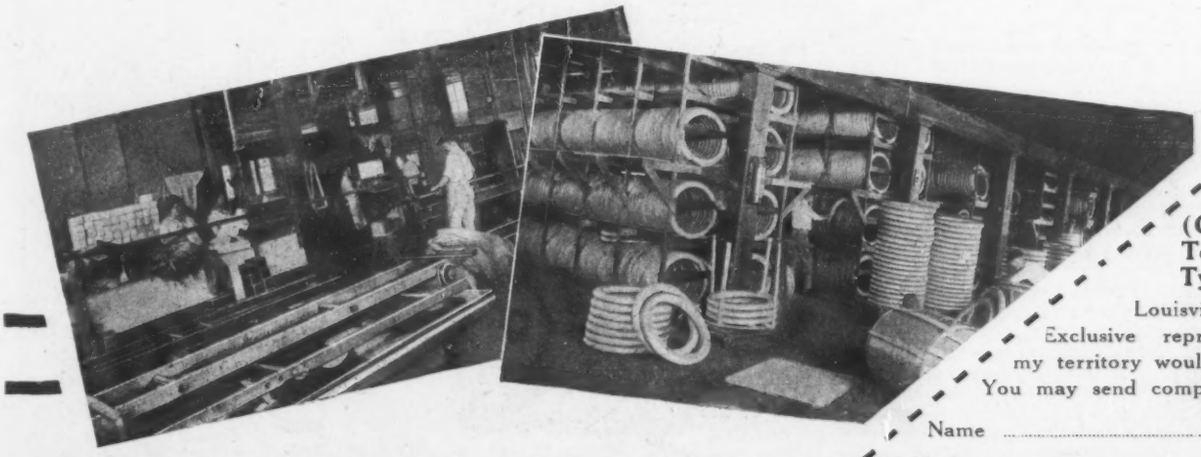
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Ten Broeck Tyre Co.

Louisville, Kentucky



(COUPON)
Ten Broeck Tyre Co.
Louisville, Kentucky.
Exclusive representation in my territory would interest me. You may send complete details.

Name .....

Address .....


National Tractor Exhibition To Be Biggest Event of Year
Thousands Attended Fourth Annual National Tractor Show in Kansas City
Kansas City District Is Tractor Hungry
TRACTOR SHOW A WONDER
WEATHER FAILS TO HALT TRACTOR SHOW CROWDS
VISITORS COME TO BUY TRACTORS; BIG SALES RECORDED
America's Greatest Tractor Show
BIG TRACTOR SHOW FINEST EVER HELD
TRACTOR SALES AT SHOW EXCEEDING EXPECTATIONS
Greatest Tractor Show in History of Industry
National Tractor Show Record in Farm
COMPREHENSIVE EXHIBITION OF FARM MACHINERY
Gov't Endorses Tractor Show
America's Greatest Tractor Show
"TRACTOR CENTER HERE"
NO DOUBT FROM THE FIRST
The Manufacturers' Exhibition
Fifth Annual
NATIONAL
Tractor Show
KANSAS CITY
"Tractor Center of the World"
February 16-21, 1920
More than Four Acres of Exhibits!
Over 400 exhibits of Tractors, Tractor Accessories and Allied Power Farming Equipment!
First appearance of 1920 Tractor Models!
First appearance of new Power Cultivators!
First display of improved plows, tools and equipment; Garden Tractors, Commercial Tractors, Farm Tractors, every type and size.
DEALERS—No Demonstrations in 1920. This great Exhibition is the only Official Strictly Tractor Show sanctioned by the National Vehicle & Implement Association and Motor Accessory Manufacturers' Association.
"The Show of Shows"
Enthusiastic Indorsement of Exhibitors!
"The great Mid-Winter Show at Kansas City is more than National—it is truly International in scope"—Finley P. Mount, President, Advance-Rumley Co.
"Count on us for a big representation at the Fifth Annual National Tractor Show at Kansas City. It gives us a wonderful opportunity to make sales but it also gives us the the opportunity to extend educational work among farmers and dealers"—James Oliver III, Oliver Chilled Plow Co.
"The publicity we get from the National Tractor Show at Kansas City is the best all around advertising we can buy at any price. It is the place where the Farmers and dealers meet.—J. B. Bartholomew, President, The Avery Co.
"The satisfactory results we derived from the National Tractor Show at Kansas City last year is the sole reason for our engaging large space at the 1920 show. We will show our complete line instead of plows and tractors alone. The great diversity in the buyers attending these shows, is the reason why the results are so satisfactory."—L. N. Burns, General Manager of the J. I. Case Plow Co.
Overland Bldg. Kansas City. Home of Annual National Tractor Show.

Just Consider These Unusual Advantages

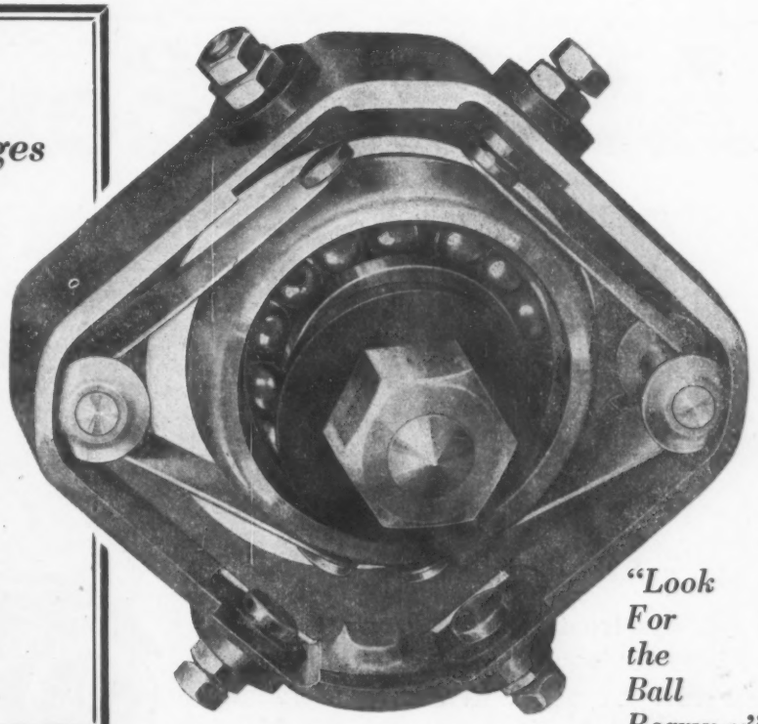
Guaranteed for 100,000 miles. We will replace any Wayne Timer which does not give service for this length of time, which in our judgment has any defects of workmanship or material.

Contact surfaces make and break with a "wiping" action. Thus insuring sure fire action every time.

The timer operates positively, i. e., the contacts are made definite by the power of the motor. The Wayne does not depend on the indirect action of a multitude of springs.

No oiling or other attention is required after installation.

Can easily be installed in place of the present timer on any Ford or Fordson Tractor of any year or model.



"Look For the Ball Bearings"

WAYNE

Ball Bearing Timer

(Patented)

There are thousands and thousands of miles of perfect timing service in the Wayne Ball Bearing Timer. It is guaranteed to stay on the job for 100,000 miles and after that it goes right on putting "pep" and power in Fords and Fordson tractors.

It is the new ball bearing principle that makes this many miled timer service possible. The balls have a slight "wiping" action on the contact bed keeping it smooth and clean—sending big, fat sparks to lazy gas, with never a miss.

The Wayne Timer will eliminate firing trouble for thousands of Ford owners in your territory—you should be the one to supply the demand for this long service timer.

Write for liberal discounts and our cooperative selling plan.

For Ford Cars and Fordson Tractors

$5.00

List Price

We Also Manufacture the Wayne Speed Pump

The pump that fills a Ford tire in just 66 strokes—its construction prevents any leakage. It is an easy acting—strong—durable pump that sells on sight and stays sold. Write for discounts.

Wayne Engineering Company

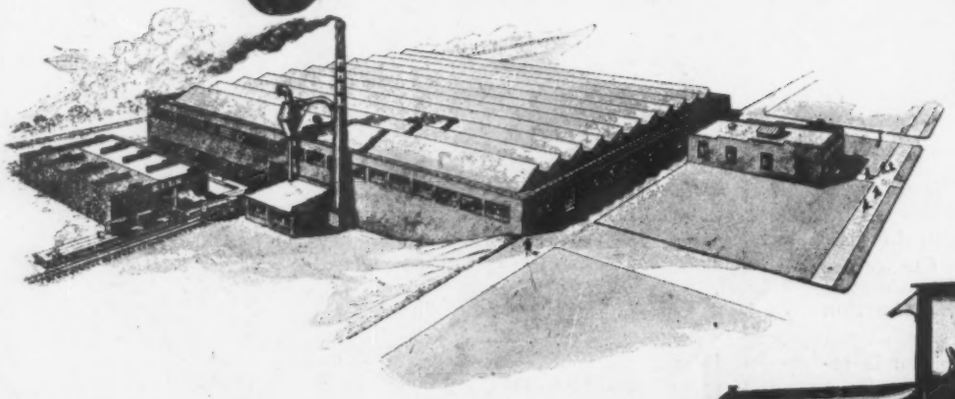
Honesdale, Penna.

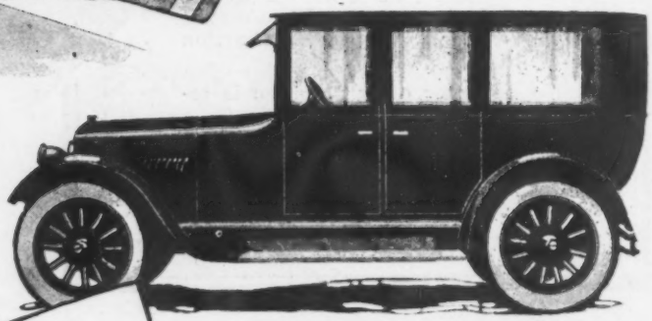
Selling Agents—Utilities Sales Corp., Stock Exchange Bldg., Phila.

WAYNE ENGINEERING

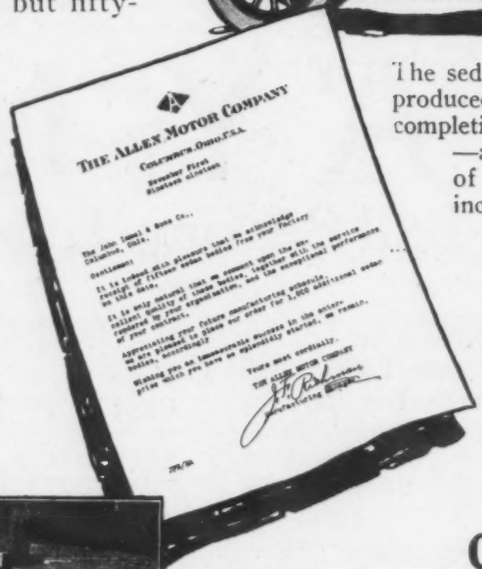
At Your Service ~

This Factory *for* Closed Motor Car Bodies





YOU can trust an Immel-built body to hold its own on the chassis of the finest car. A plant new in equipment, modern in production methods, but fifty-five years old in reputation for high grade "coach" work and vehicle construction, assures fulfillment of any contract made with you—stictly according to specifications in material and workmanship. An ample supply of time-seasoned lumber and guaranteed deliveries of steel, aluminum, hardware and all requisite materials make delivery to you on schedule a certainty.


THE ALLEN MOTOR COMPANY
COLUMBUS, OHIO, U.S.A.

The John Immel & Sons Co.,
Columbus, Ohio.

Gentlemen:

It is indeed with pleasure that we acknowledge receipt of fifteen sedan bodies from your factory on this date.

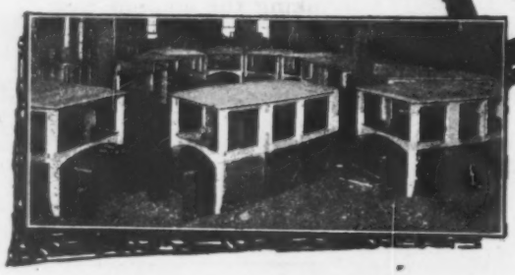
It is only natural that we connect upon the excellent quality of these bodies, together with the splendid workmanship, and the exceptional performance of your contract.

Representing your future manufacturing schedule, we are pleased to place our order for 1,000 additional sedan bodies, accordingly.

Trusting you can immediately duplicate in the future, we remain,

Yours very cordially,
THE ALLEN MOTOR COMPANY

The sedan bodies here referred to were produced in the old Immel plant before completion of the structure shown above—and delivered one month ahead of contract date. A substantial increase in the Allen Company's order proves their satisfaction. With enlarged facilities The Immel Company will render all customers the same quality of service.



Completed bodies on the floor at the Immel Plant

Immel Made Bodies Solve Your Problem of Increased Closed Car Production

Under the skilled management of veteran "coach" makers, the Immel Company is now producing every type of closed car body, built to stand the test of road conditions. The excellent transportation facilities and central position of Columbus, Ohio, location of the Immel plant puts it within easy shipping distance of motor-car manufacturing centers and keeps the freight item within the bounds of economy.

Let Us Estimate on Your Specifications

We can give you figures on production costs and delivery dates that will interest you. Write us for the facts, or send us your plan drawings—we'll return them promptly with estimates.

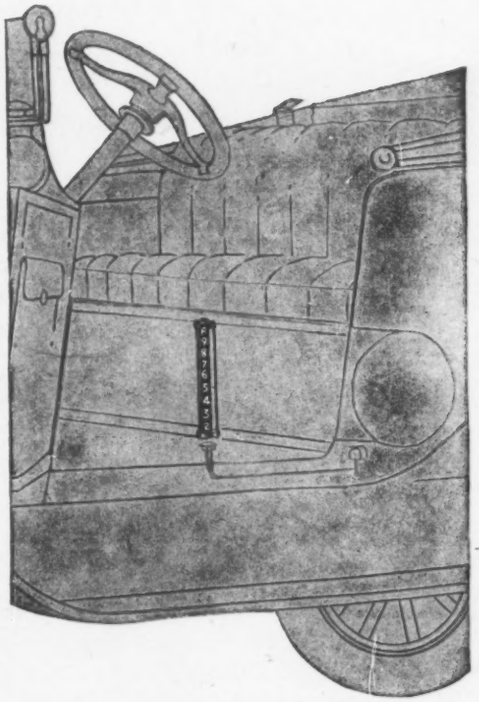
The Immel Company

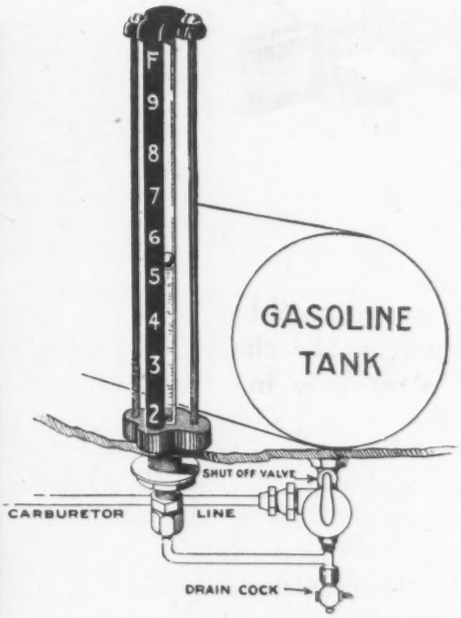
Master Builders of Vehicles Since 1865

Offices and Factory Columbus, Ohio

THE BAER-GLAUBER
FORD GASOLINE GAUGE

PATENTED





COMPLETELY ELIMINATES

1. The Measuring Stick Nuisance.
2. Constant and unnecessary lifting of the entire seat.
3. The WORRY of ever being caught with an empty gasoline tank.
4. Carburetor trouble caused by using a dusty measuring rule.
5. The possibility of being UNDERFILLED by the "gasoline man."
6. Undue loss of time in ascertaining amount of gas in tank.

BECAUSE—The Baer-Glauber Gauge

1. Cannot help but be seen EVERY TIME the driver enters his car.
2. Contains a red ball which floats on gasoline in gauge, making the amount easy to read.
3. Is at all times thoroughly accurate.
4. Cannot get out of order, since it works solely on a simple GRAVITY principle.
5. Is durably constructed and easily attached.
6. Is unconditionally guaranteed in accuracy, workmanship and material.

Fits all Fords. Weight 1 lb. Full attaching directions with each outfit.

RETAILS FOR $3.00

THE BAER-GLAUBER COMPANY

6523 Euclid Avenue, Cleveland, Ohio

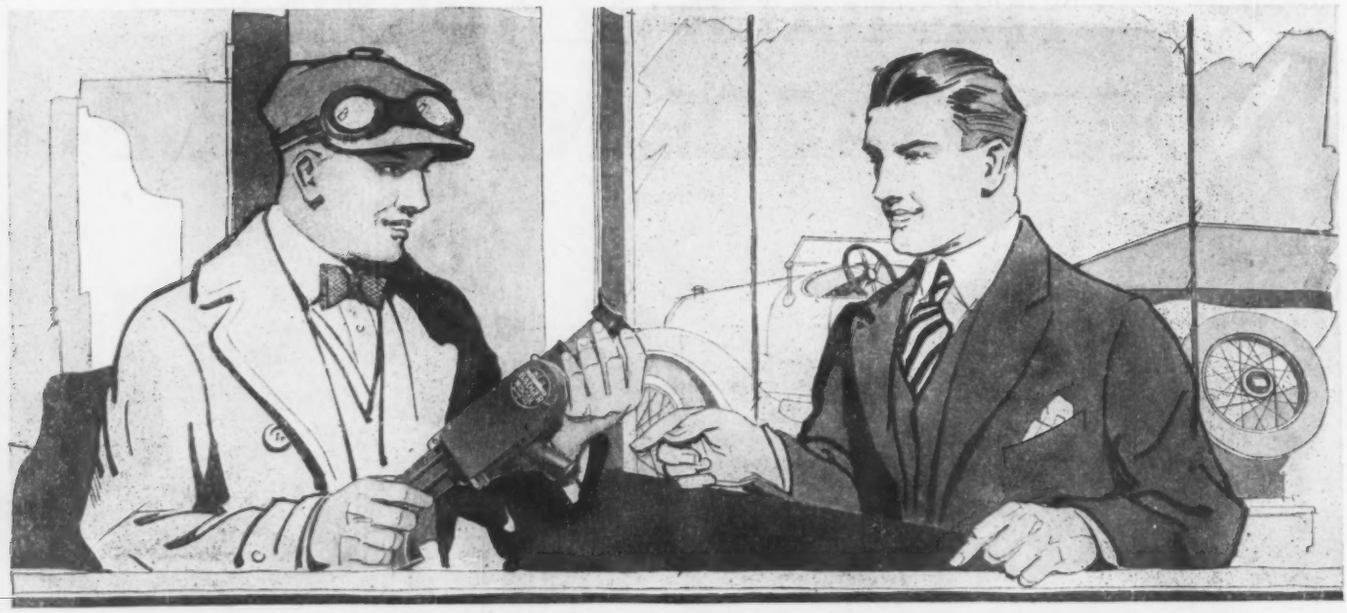
THE BAER-GLAUBER COMPANY,
6523 Euclid Avenue,
Cleveland, Ohio.

Gentlemen:—
Enter our order for one dozen FORD GASOLINE GAUGES, allowing us the trade discount. Include advertising matter and your attractive display cards.

Name.....

Street.....

Town....., State.....



"If It Doesn't Satisfy You—Bring It Back"

That's the kind of talk it takes to sell goods. It creates confidence. It establishes a plane of buying protection. Any motorist knows that the dealer who makes such a statement is sure of the quality of his merchandise.

Dealers who handle the Walker Badger line of automobile and Truck Jacks—***are*** sure. There is no question as to quality.

We, the manufacturers, stand solidly back of the dealer. We support him. Make selling easy. And satisfaction certain.



WALKER BADGER AUTOMOBILE JACKS

Are critically factory tested for lifting strength and endurance. Labeled with lifting capacity.

Each is packed in a neat, attractive cardboard carton—and on the carton is our printed guarantee of satisfactory service—*signed* by us. A positive pledge—which will never be violated.

Our confidence in our own product begets buyers' confidence. It proves as nothing else can that Walker Badger Jacks are designed and built to *give* trustworthy—dependable service. And they *do*.

Walker Badger Jacks possess many exclusive and vitally important improvements—many selling advantages which promote profitable, desirable trade.

DEALERS, send for Catalogue illustrating and describing the entire Walker Badger Jack Line—"a Jack for every job." Get our dealer's proposition and dealer's sales-making helps.

Walker Manufacturing Co.

25 Hamilton Street

Racine : : : Wisconsin



Insulated for Life

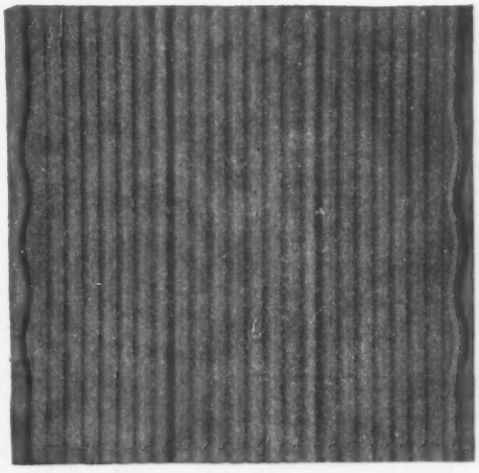
THERE'S a good slogan to pass on to any car owner who asks you about a new battery.

As a dealer you know what a common thing re-insulation is with most batteries—and what a disagreeable surprise it is to Mr. Car Owner when he first learns about it.

Here's one expense he doesn't have to worry about if he buys a Still Better Willard with Threaded Rubber Insulation. We'll back that statement to the limit.

If you're not completely **posted** as to what co-operation with Willard may be worth to you, call us on the 'phone and we'll be glad to drop in and tell you.

Willard Service
(in your town)



This is what Threaded Rubber Insulation looks like. No car dealer can afford not to be posted on what it's doing for car owners. It makes nothing short of a new and better kind of battery.

Willard STORAGE BATTERY

Willard Threaded Rubber Insulation



The Truck With a Reputation to Sustain

The new Stoughton Oversize Truck bears a name known far over sixty years in connection with the "real" Stoughton Wagon. It is backed by an immense organization with ample resources which carries assurance of absolute manufacturing dependability.

The prestige of the builders alone would sell the Stoughton truck, but the truck itself will stand squarely on its own performance and out-sell any other make in its field.

The dependability and greater economy of the new Stoughton truck is the result of **Oversize** strength in every wearing part.

We have an extraordinary dealer proposition. Write today for particulars and catalogue.

THE
STOUGHTON WAGON CO.
STOUGHTON, WIS.

STOUGHTON TRUCKS



"Go ahead! Laugh!—It's coming to me for not buying those COMPRESSION TUBES I saw the other day—I'M CURED!"

If you own a car this has been your experience unless you live near a dealer who sells "Compression Tubes" and have taken his advice and "so equipped."

In the ordinary tube "a puncture is a puncture" till you take out the tube and spend time and money in having it fixed.

If you have Compression Tubes in your tires a puncture isn't a puncture —and this is why:

The Compression Tube is larger in its normal cross-section outline—(Cut 1)—than the inner line of the tire. When inflated—(Cut 2)—the pure gum is placed under a tense, radial compression, gripping the puncturing object and closing the hole tight when the object is withdrawn.

No Filler—No Insert—Rubber and Air—That's All

Good for 30,000 miles—costs less and pays the price of an ordinary inner tube many times over—also increases tire mileage and decreases fuel consumption *through holding a uniform pressure.* No riding on flat tires which breaks the walls and reduces the life of the casings.



DEALERS—this is your bunch of selling arguments. They cash in heavily. *The economical car owner can't get away from them.* Write and get the profit and service angles on this remarkable tube evolution.

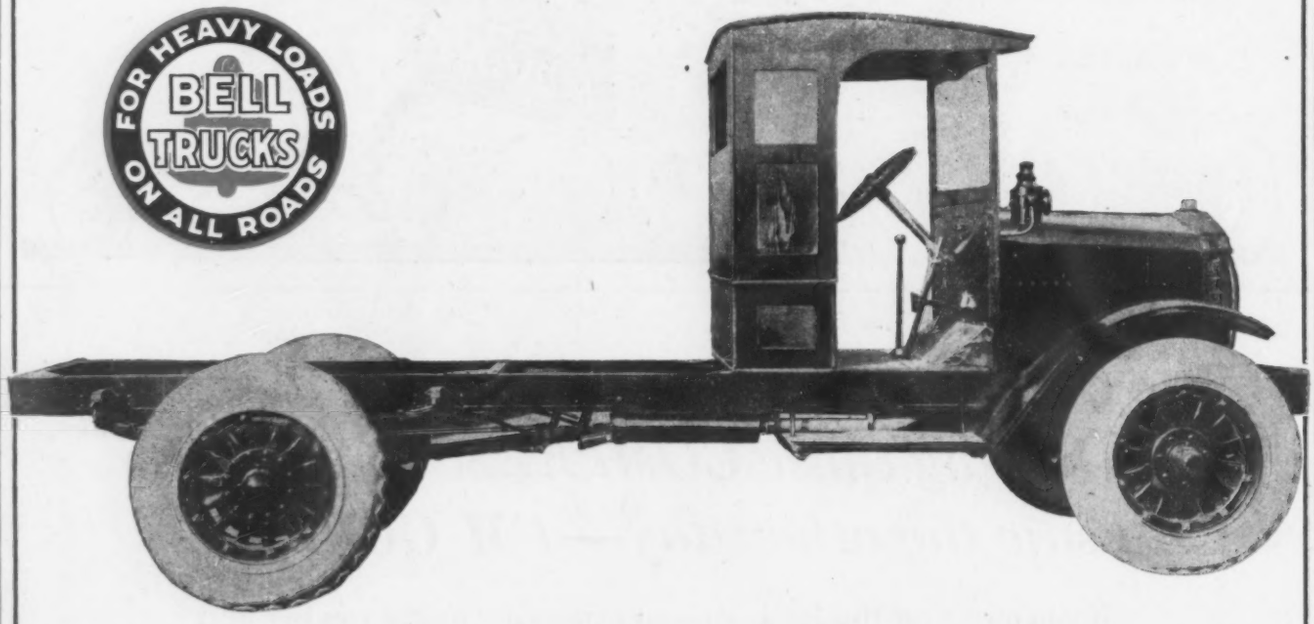


Compression Tube and Tire Corp.

Eastern Territory:
Sales Office: 318 West 39th St., New York
Territory West of Mississippi River:
U. S. Compression Inner Tube Co., Tulsa, Okla.

Keep Moving With

COMPRESSION TUBES



BELL TRUCKS

Ruggedness, Serviceability and Power

are embodied in the Bell Truck.

These qualities enable it to give to the user the lowest cost *per ton mile*. And the Bell Truck can do it every day in the year.

With its extra power and sturdy construction it can deliver maximum loads at minimum cost.

Dealers who want dealer mastery want the Bell Agency.

Write for particulars.

Iowa Motor Truck Company

OTTUMWA IOWA

A Radical Innovation in Pneumatics



The Results That Pneumatic Tire Manufacturers Have Been Continually Striving For—The evils they have been trying to overcome—are met in the new Eagle Puncture-Proof Tire—The Latest Development In The Tire Industry.

All The Advantages of the pneumatic tire—its resiliency—mileage and speed are combined in the Eagle Puncture-Proof Tire.

The Eagle Puncture-Proof Tire is a simple application of a scientific principle. It combines two pneumatic tires with their individual inner tubes, with a larger, heavy, tough, resilient outer tire of solid rubber and eliminates pneumatic tire troubles by protecting the two inner tires against punctures and blow-outs with a sheet steel rim.

On heavy duty trucks where mileage is a factor, where speed, positive traction and reduction of vibration are essential, these new tires show remarkable efficiency and service.

All the resiliency of a pneumatic is secured by the combination of the heavy solid rubber tread and the sheet steel rim, which permits the truck to ride on the pneumatics but with that security against punctures and blow-outs which is not possible with the heavy pneumatic tires.

The Eagle Puncture-Proof Tire offers truck owners and dealers the biggest sales opportunity in the tire industry. It overcomes every possible resistance to the heavy pneumatic tire and reaches the point that the manufacturers themselves have been trying to reach for years.

Eagle Puncture-Proof Tires are demountable. They are attractive in appearance, sturdy and rugged. They absorb road shocks without vibration and prevent the continual expense bill.

Guaranteed Puncture-Proof for One Year.

Made in standard sizes for passenger cars as well as trucks.

We want every dealer in the country to be familiar with the mechanical construction and design of this tire. We want you to be able to answer the questions of the interested buyer and demonstrate the particularly superior points of this newest tire.

Write today for our list prices, discounts and complete details.

EAGLE PUNCTURE-PROOF TIRE CO., Inc.

1662-1664 Broadway **New York City**



No. 11

RAY
SOCKET WRENCH SETS

"The Set in the Indestructible Steel Box"

The compactness of these sets appeals not only to the car owner but to the repairman.

The "RAY" Socket Wrench sets are the only sets packed in drawn steel boxes.



No. 31

Put up in various assortments ranging from 9 tools to 53 tools and covering a range of work from the simplest to the most complex machine, auto or tractor repair.

Prices
$3.50 to $17.50
Per Set

——DEALERS——

If your jobber cannot supply you—send us your order and your jobber's name.

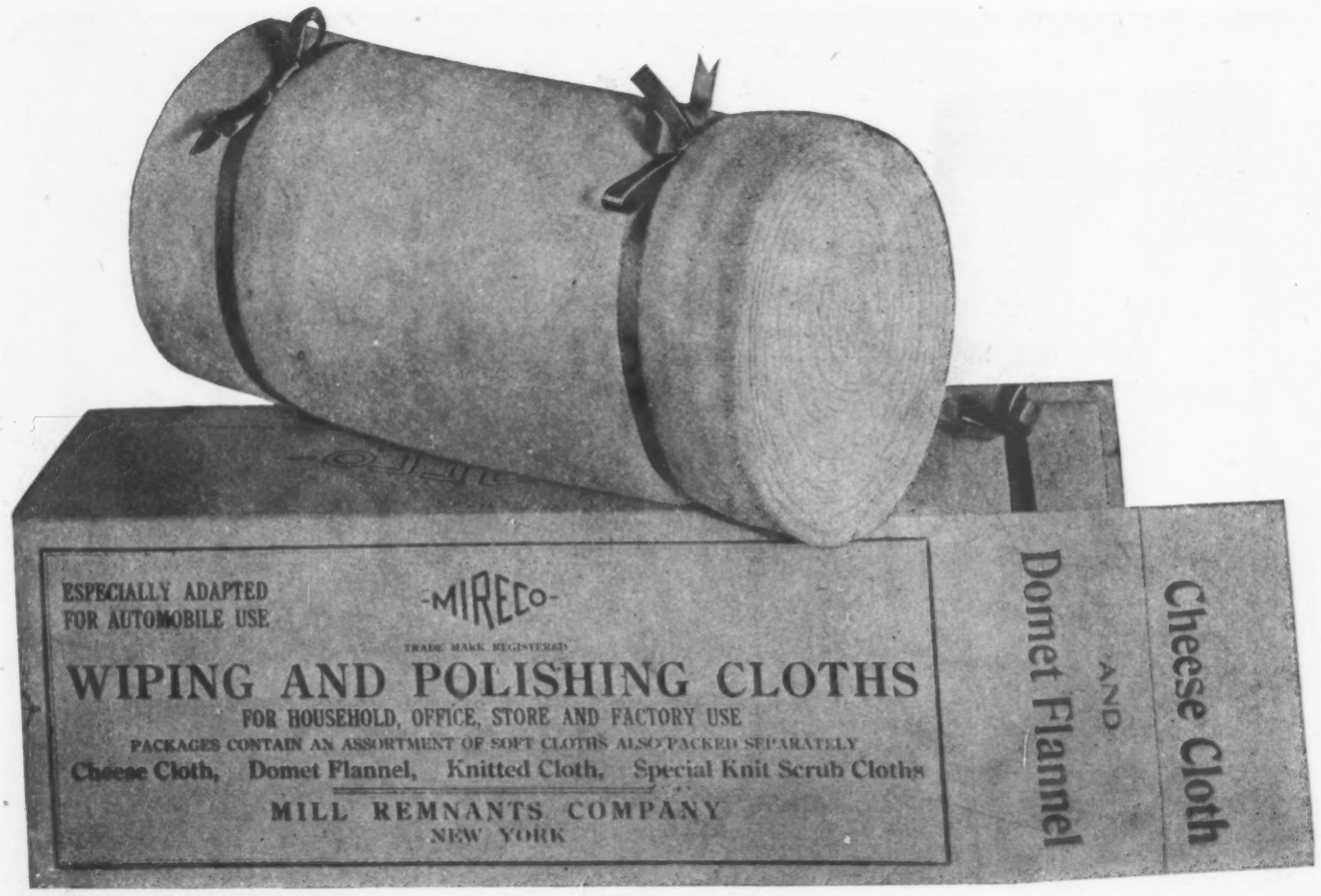
RAY Socket Wrench Sets packed only in steel boxes are more compact than other socket sets—the largest RAY set containing 53 guaranteed tools can be carried in the tool box or door pocket of almost any car, occupying a space only 12¾"x7¾"x2".

MANUFACTURED BY

PACKER AUTO SPECIALTY CO.
1420 Michigan Ave.
CHICAGO, ILL.



No. 39



Car Owners Like This Big Handy Package of Fresh Clean Wiping Cloths

Every car owner and every chauffeur who sees this generous bundle of new, fresh, clean cloths wants a package.

The package contains an assortment of domet flannels, cheese cloths and other material especially adapted for wiping and polishing a motor car.

You won't find any soiled or rough pieces which will mar the finish of a car.

All New Goods

These cloths are all new goods or remnants direct from the largest mills in the country. Each piece is carefully inspected when packed so that no hard-finish or soiled pieces go in the package. All cloths cut in convenient lengths ready for use.

Hundreds of car owners and garages use Mireco wiping and polishing cloths and find them not only superior but much cheaper than goods bought by the yard over the counter.

Many motor car manufacturers use these cloths in their factory to give the finishing touches before the car is shipped.

Easy to Sell This Package

Dealers find that this is one of the fastest selling accessories they have on their shelves because of the convenience and the generous size of each package.

When you sell a car owner one of these packages you have a steady customer because he won't go back to the old way of buying expensive cloth for this purpose.

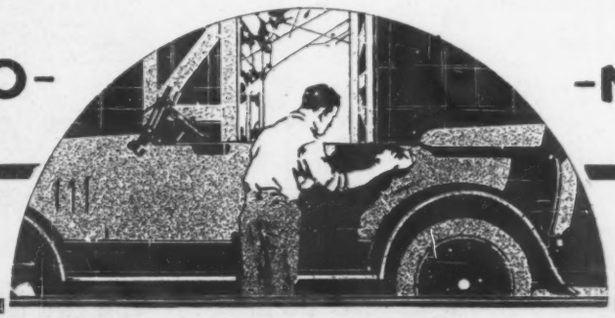
"A Waste Thread Nowhere."

Put up by

Mill Remnants Co.

19 Bond Street, New York City

-MIRECO-



-MIRECO-

Enough in each package to last half a season. Retails for $1.25 with a liberal profit for you.

Send in your order for a dozen packages today. If your jobber can't supply write direct.



Allis-Chalmers
High Grade—Reliable

Air Compressor Equipments

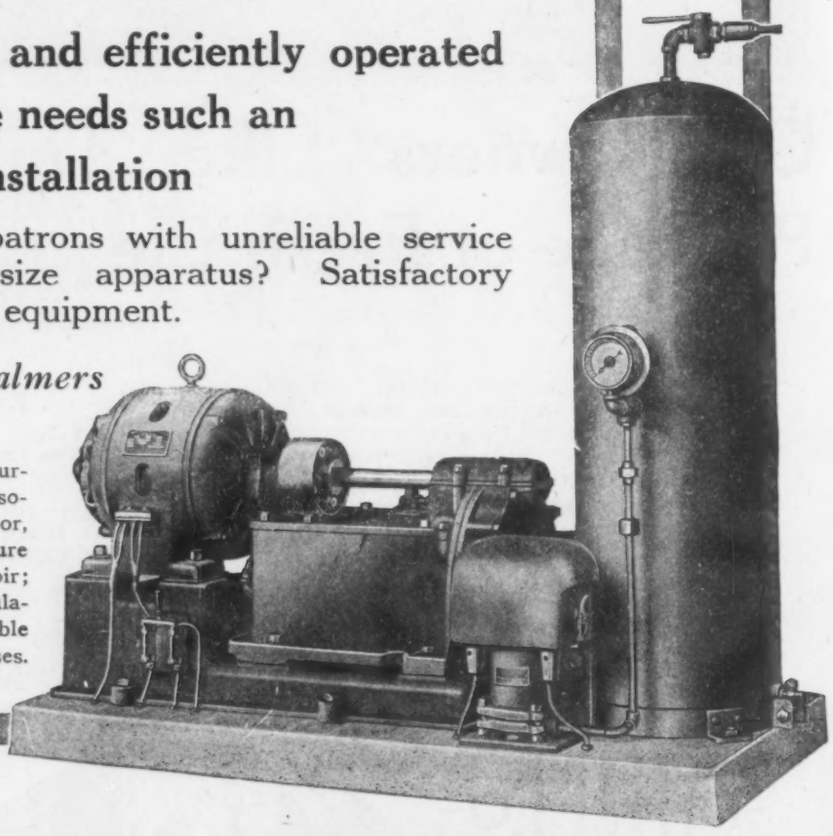
Automatically maintain pressure within close limits. Require practically no attention.

Every successful and efficiently operated garage needs such an installation

Why disgust your patrons with unreliable service from cheap, undersize apparatus? Satisfactory service requires good equipment.

Send For Allis-Chalmers Bulletin No. 1536

Allis-Chalmers equipments are furnished complete with all accessories and include: Air compressor, motor driven; automatic pressure governor; air gauge; reservoir; compressor and governor insulators; pop safety valve; adjustable motor switch; fuse base and fuses.



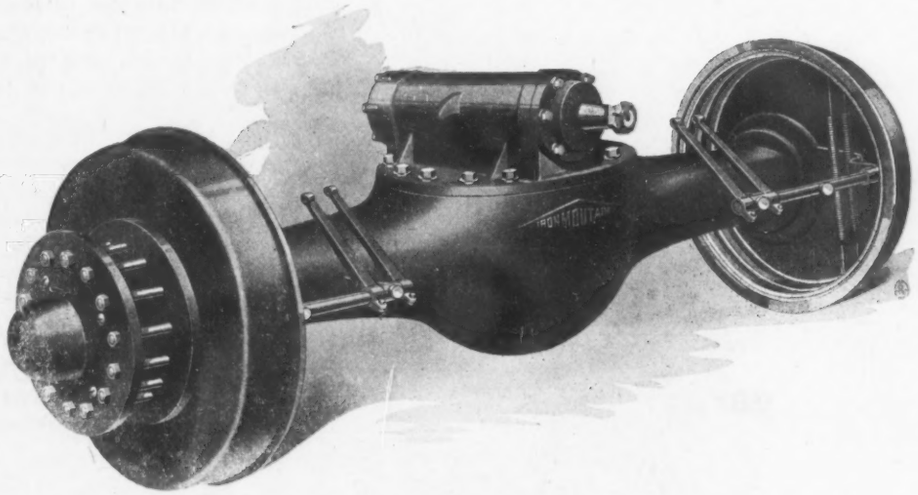
ALLIS-CHALMERS

MILWAUKEE, WIS. U. S. A.

IRON MOUNTAIN
TRADE MARK

IRON MOUNTAIN

WORM DRIVE AXLES



AXLES PLUS SERVICE

With the motor truck builder, it is not always the problem of axles, but more nearly *axles plus service*. With your truck building program worked out and adopted, your sales agencies furnished with final schedules of truck shipments, service by the axle builder is just as important as the product he furnishes. Ability to properly serve, as well as to manufacture, must always be the real test in the problem of efficient axle distribution.

IT WILL PAY YOU TO INVESTIGATE

IRON MOUNTAIN SERVICE

IRON MOUNTAIN CO.

927 E. Ninety-fifth St.

CHICAGO, ILL.



1920's Powerful Magnet

There's a real stimulating influence in the distinctive Jackson line for 1920, and picked dealers have been quick to capitalize on it! Presenting at a medium price many of the finer features of the highest priced cars, the Jackson is a powerful magnet that draws trade and builds a permanent and profitable business that will grow in possibilities season after season

Three beautiful models—the Touring, $2150; the sport model that is daringly different, $2650, and the ultra-advanced Sedan of quiet distinctiveness and refinement $3150. "Look for the nickelled keystone radiator"—the mark of the Jackson.

There are exceptional features about the Jackson franchise, together with greater production and delivery facilities which will interest those dealers who are looking for something above the average. Details upon request.

JACKSON MOTORS CORPORATION

"Motor Car Builders for over 16 Years"

Sales Dept. 6—Jackson Motors Bldg.
JACKSON, MICHIGAN

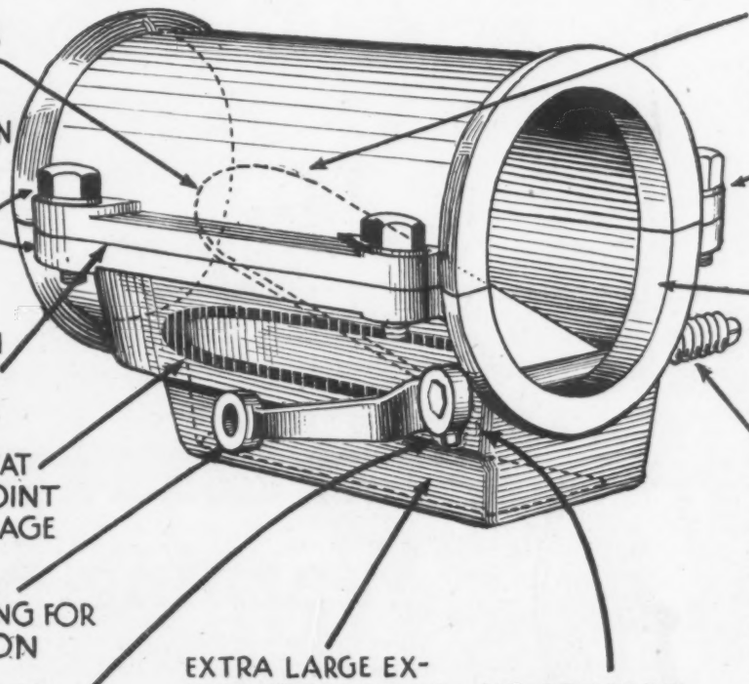


No Hill Too Steep

Jackson SIX

No Sand Too Deep

Cooper "SPECIAL" CUTOUT



LONG SLANTED FLAPPER ALLOWING FREE PASSAGE OF EXHAUST WITHOUT ABRUPT OBSTRUCTION

TWO HALVES BOLT ON TIGHT-SAVES CUTTING EXHAUST PIPE IN TWO

SURFACES BETWEEN VALVE GROUND TO PREVENT LEAKAGE

MACHINED VALVE SEAT INSURING TIGHT JOINT PREVENTING LEAKAGE WHEN CLOSED

LONG LEVER MAKING FOR EASE OF OPERATION

LEVER ADJUSTABLE TO SIX DIFFERENT POSITIONS FACILITATING INSTALLATION

EXTRA LARGE EXHAUST OPENING PREVENTING POSSIBILITY OF BACK PRESSURE

NO BEARINGS UNDER REAR OF FLAPPER ALLOWING IT TO MAKE TIGHT JOINT WHEN CLOSED

FLAPPER DESIGNED TO FIT EXHAUST PIPE EFFECTIVELY SHUTTING EXHAUST GASES FROM MUFFLER

LOCK WASHERS PREVENT LOOSENING OF CAP SCREWS

PIPE OPENINGS BORED AND REAMED TO MAKE TIGHT FIT ON EXHAUST PIPE

TENSION SPRING FASTENED DIRECT TO LEVER SHAFT AWAY FROM BODY OF CASTING TO PREVENT WEAKENING FROM EXHAUST TEMPERATURE

FOR MORE SPEED AND LESS COST

Here's the cutout that has won the enthusiastic endorsement of the motor car owners of the land because it represents the logical principles for definite cost-cutting. It keeps the cylinders clean—blasts out every atom of carbon and keeps the motor running as smoothly as a new watch. And it increases the speed. When the pedal is pushed, it sends the car leaping forward like the wind. That's why it's the favorite with real motorists. And there's a COOPER "SPECIAL" CUTOUT for every car.

SIZES		With No. 3 Pedal	With No. 4 Pedal
1½ in.	Complete	$3.00	$3.50
1⅝, 1¾, 1⅞ in.	"	3.50	4.00
2, 2⅛ in.	"	4.00	4.50
2¼, 2⅜, 2½, 2⅝ in.	"	4.50	5.00
2¾, 2⅞, 3 in.	"	6.00	6.00



No. 3 Pedal



No. 4 Pedal

COOPER MANUFACTURING CO.

Dept. A. Marshalltown, Iowa

THE FULTON COMPANY

Sales Managers

Dept. A. Milwaukee, Wis.

When A Positive Warning Is Vital





The Sampson Warning Signal

When a human life is in the balance—when a collision is impending—there's no time to adjust the horn, connect loosened wiring, or to repair a fragile whistle that has been broken by an accidental slip of the wrench.

When traffic impedes and minutes count, a signal which is often out of order or with a listless blast is exasperating. **Always**—the driver should have at instant command the **unfailing** clear demand for right of way of the **SAMPSON.**

RELIABLE, FOOLPROOF AUTHORITATIVE

$2.50 Complete

For car with overhead valves not equipped with priming cups, our special attachment is 50c additional. Any time you would rather have your money than the **SAMPSON,** we guarantee to accept its return at the full purchase price.

Operates by cylinder compression—causes no loss of power. Simply installed in place of priming cup with a wrench. The patent valve automatically scrapes and cleans itself of carbon. Made of heavy metal stampings, handsomely nickeled. Its strength survives ordinary knocks and hard service. It is simply and scientifically correct—no adjusting—always right.



MANUFACTURERS!

The **Sampson** has proved itself worthy of the title, "standard equipment for your truck or car." Write for special contract proposition.

DEALERS!

National advertising and the real need the **Sampson** fills has created a tremendous demand. Get our interesting offer—write now.

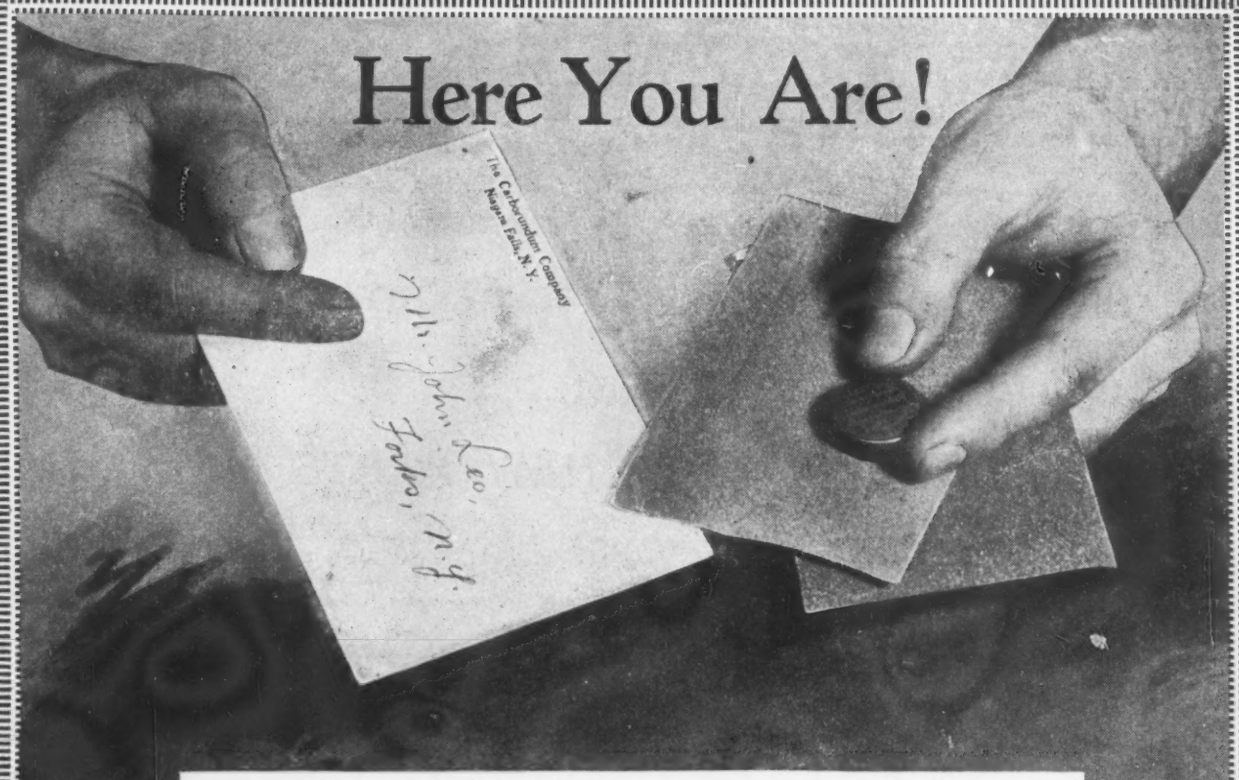
OWNERS!

Don't lock the barn after the horse has been stolen. **Now** is the time you need the **Sampson's** efficiency and safety insurance. See your dealer today.

SAMPSON MFG. CO.

1607-11 Prairie Ave. CHICAGO, ILL.

Here You Are!



JUST send us your name and address and back will come an envelope containing a sample can of Carborundum Valve Grinding Compound and two sheets of Aloxite Cloth.

Try the compound on your next valve grinding job. Note how quickly and easily it cuts away the carbon and pit marks. How true, clean and smooth it leaves the valve seat. It cuts remarkably fast without scratching or scoring. It will do your valve grinding and lapping quicker, better, easier.

Try the sample sheets of Aloxite Cloth on any shop work. It cuts clean and quick, leaving a smooth, uniform finish. It is wonderfully flexible and is uniformly coated with Aloxite grains.

Your accessory jobber or hardware man carries both these products—the compound in handy combination cans or one of five-pound tins—the Aloxite Cloth in rolls, sheets, or better still, in Economy Rolls.

But Be Sure You Send for the Samples

THE CARBORUNDUM COMPANY

NIAGARA FALLS, N. Y.

NEW YORK CHICAGO BOSTON PHILADELPHIA CLEVELAND CINCINNATI PITTSBURGH MILWAUKEE GRAND RAPIDS

BERMO WELDING APPARATUS

Guaranteed for One Year
Used in All Parts of the World

For Welding All Metals Any Size, Shape or Weight
For Brazing, Lead-Burning and Cutting Steel
For Instantly Removing Carbon from Gas Motor Cylinders

HIGH GRADE EQUIPMENT—THAT IS NOT EXPENSIVE

Two hours work per day with a "Bermo" will pay for it, the gas used and labor expended in sixty days. We will furnish the necessary equipment to any shop on terms that will enable the purchaser to pay for it out of the earnings. With a "Bermo" in your shop you can replace everything except time and you **Save** it.

OLD PARTS MADE NEW, NEW PARTS MADE TOO

All broken, worn or defective metal parts of all kinds, shapes or sizes can be quickly and permanently welded with BERMO APPARATUS. Jobs that cannot be handled at a profit in any other manner, can be accepted, done successfully. You will avoid the delay of days and sometimes weeks in getting new parts from the factories. Broken parts of engines, motors and machinery which are no longer on the market can be repaired quickly, thereby reclaiming an otherwise useless article. The saving in cost and time to customers will be considerable. Naturally this builds up a reputation for the shop equipped with BERMO.

A first-class dependable welding plant is the most important equipment for any shop, factory, foundry or business (large or small), where machinery or metals of any kind are used or handled.

Connections with Reliable Firms or Agents are Wanted *Correspondence in All Languages*

BERTSCHY ENGINEERING CO. **Omaha, Nebr., U. S. A.**

Class Journal Publications

AUTOMOTIVE INDUSTRIES

The Engineering and Industrial Authority of the Automotive Field—Motor Cars, Trucks, Tractors, Airplanes. Read by Engineers, Production Managers, and other Executives of Automotive Manufacturing Companies.

MOTOR WORLD

A Dealers' Journal, devoted principally to the *Distribution or Merchandising* of Automotive Products and Equipment. In conjunction with Motor Age covers nearly 90% of the principal Dealer field.

MOTOR AGE

A Dealers' Journal, devoted principally to the *Maintenance* of Automotive Apparatus and Equipment. In conjunction with Motor World, covers nearly 90% of the principal Dealer field.

MOTOR BOAT

The oldest motor boat publication in the world. Read by Boat Owners, boat builders and supply dealers.

THE COMMERCIAL VEHICLE

The Oldest Truck publication in the United States. Read by Fleet Owners, their Traffic and Garage Managers. The logical medium for an advertiser who wishes to reach the real, important truck *users.*

EL AUTOMOVIL AMERICANO

The only automotive export paper going exclusively to Dealers and other members of the Automotive Trade in Latin America.

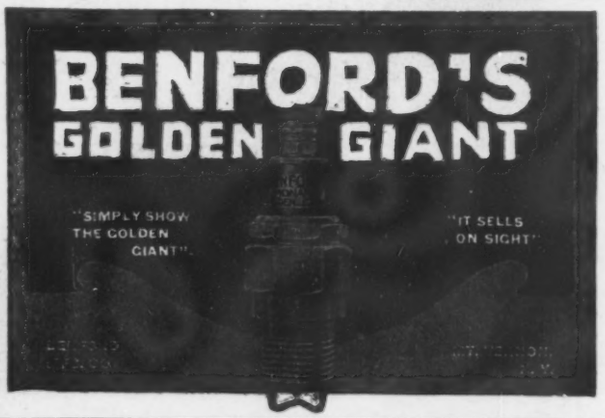
TRANSFER & STORAGE

Reaches 75% of the purchasing power wielded by the Transfer & Storage Industry, Transportation Companies, Pool Car Distributors, Public Merchandise Warehouses. A wealthy and active field needing Trucks, Labor Saving Devices, Warehouse Equipment, etc.

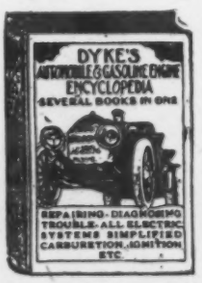
THE TIRE RATE BOOK

A quarterly publication containing special current information for Tire Dealers—price lists, types, sizes, etc. In constant use by practically all principal tire distributors.

THE CLASS JOURNAL COMPANY
CHICAGO **NEW YORK**
Philadelphia Cleveland Detroit



Dyke's 1919 Automobile Encyclopedia



This new book explains the principles of all engines, valves, carburetors, ignition, self-starters—in fact everything you want to know. It shows how to overhaul a car from the ground up, how to make all repairs, etc.

Complete Ford instructions have been included and six, eight and twin six engines and their troubles are indicated so clearly that anyone may understand their operation and repair.

The electrical section of the book is up-to-date and thoroughly treats on the principle, construction, operation and care of the leading electric starting, generating, ignition and lighting systems, Delco, Atwater-Kent, Bosch, "Two-Point" and other systems are simply explained.

New material on airplanes and airplane engines are also included.

956 Pages 7 x 10 In., 3362 Figures. Cloth Bound. Price, $5.46 Postpaid

U. P. C. Book Co., Inc., 243-249 W. 39th St., N. Y.

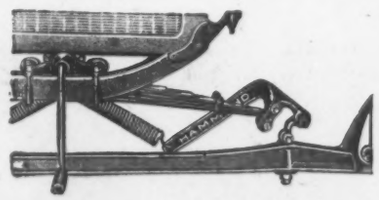


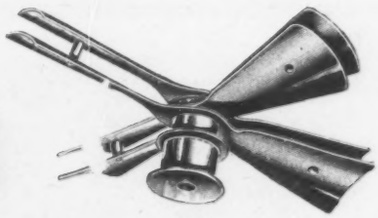
Black enamel finish, $10.00

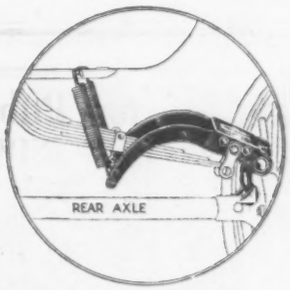
FLEXIBLE SPRING STEEL BUMPER

Made Exclusively for Ford Cars and Truck Attachments and Fully Covered by United States Patents

Provides REAL protection in the event of collision—improves the appearance of every Ford car. The weak point of most bumpers is the arm supports. Note the brackets of the FLEXIBLE SPRING Bumper, conceded as being the strongest and most substantial yet devised. A perfect fit; no holes to drill; quickly and as easily installed on Ford trucks as on cars.







Single Arm type equipped with DROP FORGED PERCHES. We are the only manufacturer using a one piece solid drop forged perch on single arm shock absorbers.

Combines maximum strength with lightness and neat design. It saves tires from excessive wear, eliminates vibration and stops rattle at steering wheel.

For Ford passenger Cars, Trucks and Tractors, mark the advent of a new type of fan that produces high air velocities at low speeds, thus filling the urgent need for an efficient fan for cooling.

Old-style, single-blade fans found on the average car pull the air through the center of the radiator ONLY. But the eight blades of the PITTER Multiblade FAN draw the air from the outer end of each blade, so that there is an equal distribution of air supply through all parts of the radiator.

This improved Double Arm Shock Absorber absolutely absorbs shocks, jars and jolts as quickly as they are created. Saves tires from wear and tear by smoothing out road inequalities. Does away with vibrations. There is nothing to get out of order; nothing to interfere with steering. Easy to install. No machining. no holes to drill or tap.

If any of these articles are not entirely satisfactory will refund the purchase price paid us any time within 30 days.

R. & R. Flexible Rider Company, Inc.

208 S. LaSalle St.

CHICAGO, ILL.

A Better Battery
A Better Price

THE BETTER M & M BATTERY

Our New Service Plan Gives You a Discount of

50%—10%—5%

The M. & M. battery is not a new battery, nor is it an experiment, but a battery that has 14 years of manufacture behind it, a battery that has carried a **real guarantee** for the past ten years. This battery has never been sold to dealers or jobbers at a discount greater than 50% off, but through our new service plan, you have the opportunity of buying this battery at 50%—10%—5% from list.

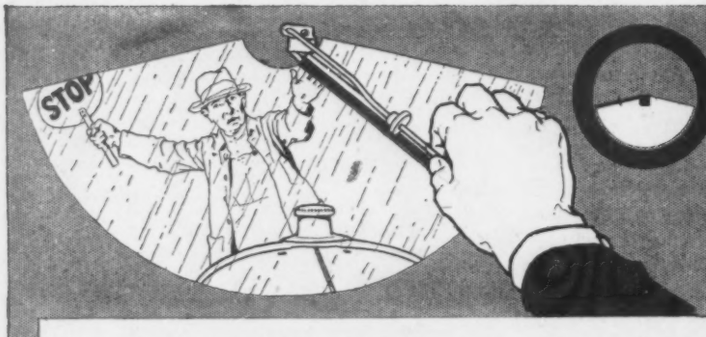


A REAL GUARANTEE

If any M. & M. battery fails to develop at least 80% of its efficiency at the end of one year, said battery will be restored to at least 80% of its original capacity.

MOLTER SERVICE

Association Bldg., Chicago, Ill.



OUTLOOK
WINDSHIELD CLEANER
$2.00

Sell the Best Known Cleaner!

Outlook is not only the best cleaner but the best-known cleaner. It has a thoroughly established trade among satisfied users. Now extensive advertising is making it still better known. Dealers are concentrating their efforts on Outlook because it fills a real need, because it has a demand established and because a satisfactory profit can be made by pushing it.

Get in touch with your jobber TODAY for prices. This is an all season seller but there's no use missing business right now when sales are easiest of all!

THE OUTLOOK COMPANY
5577 Euclid Avenue, Cleveland

Ought to be Legal Requirement

Many dealers say "The law should compel the use of windshield cleaners." It's coming some day! In the meantime certain far-sighted dealers will be *skimming the cream off the trade.* Why not be one of them? Now is the time to make your profits!

Feature the Outlook

Put the Outlook Cleaner in stock. Call it to your customers' attention. Feature it in the window every stormy day. Put the same effort behind it that you would put behind *any* active line, and you'll find it turning your capital at a mighty pleasing rate! *Have you an Outlook on your own car?*



No Loop Holes for Trade Loss

There's only one limit to UNIVERSAL BATTERY business—and that is the *total* number of battery users in your trade territory. *Every* battery owner is a prospect—and a *live* one. The vast majority of them *can* be sold—and *re*-sold repeatedly. There is no sales loss—no profit leakage.

UNIVERSAL business is permanent business. In the first place, UNIVERSAL BATTERIES render most efficient and economical service.

Thousands upon thousands of tests prove *that* absolutely. Motorists *know* the UNIVERSAL. They are familiar with its super-worth. This means prestage — it means patronage — it means ever-increasing profits through increased volume of business.

Next—and this is *important*—UNIVERSAL BATTERY parts can be employed on all standard makes of batteries. You can serve any battery user. You are not tied down to one particular brand. *Your* service is UNIVERSAL.

The UNIVERSAL Agency proposition is the most attractive you've ever seen—the most business like in every respect. The dealer who can meet our requirements is assured the biggest, best paying battery trade in his selling zone.

We also manufacture Universal Sealed Glass Cell Batteries for house lighting systems and parts for any make of sealed glass cell Batteries.

Particulars upon request to reliable persons already engaged in the sale of batteries or seriously considering going into the battery business.



Universal Battery Co.

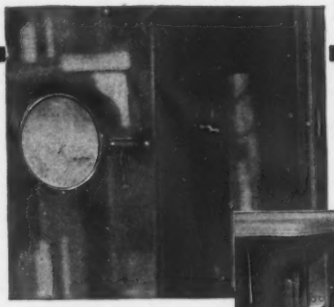
3440 So. La Salle St., Chicago, Ill.

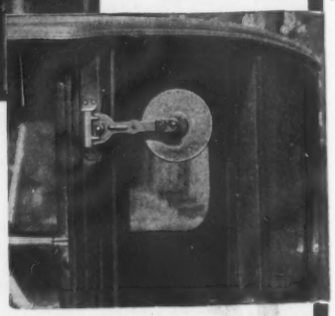
UNIVERSAL Batteries

Style "B"



Style "C"





Hindview

Auto Mirrors

THE EYES IN THE BACK OF YOUR HEAD

THERE's a ready-made demand for Hindview Auto Mirrors.
The legislators of Massachusetts, New York, Connecticut, New Jersey, California, and the province of Ontario say that every motorist must equip his car with a hindview mirror.
In other states similar bills are before the lawmakers.
You can meet this demand with an already popular line of auto mirrors—the Hindview Mirrors. Right now the sales of these mirrors are keeping dealers' stocks turning—netting handsome profits.

And no wonder—for Hindview Mirrors sell on their superior merits. Take the ball joint that allows easy adjustment in any position—the large 5 inch circular plain or lens plate-glass mirror—its weather-proof finish and rigid construction—they mean consumer satisfaction.

There's a good profit in selling this quality line that meets all needs—and our proposition is mighty attractive—write for it, also folder No. 19 describing all models.

KALES STAMPING CO. 462 West Lafayette Blvd., DETROIT, MICH.

NOTE THE DOUBLE GRIP AT EACH END

E-Z

DOUBLE GRIP AUTO RIM COLLAPSES

CANNOT TWIST OR STRAIN THE RIM



Rim lifts out easily and quickly. No danger of injury to either tire or rim. Tool is locked and holds rim securely until it is replaced.

The double grip eliminates all possibility of twisting or straining the rim. The ends of the rim remain parallel and the rim maintains its natural shape.

Note the design of the tool. The action is based on a compound leverage principle which gives a true pull and eliminates any possibility of strain.

This tool is quick and easy in action. It is attached in a minute and can be operated by a child. It does away with all chance of injury to the tube or casing. It removes a tire from the rim in a fraction of the time ordinarily required.

The entire tool is made of cold rolled steel and will last a lifetime. (No castings are used.)

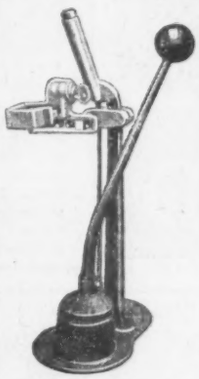
Dealers:—Order through your jobber or write for complete details.
Jobbers:—Write for our proposition.

EASTERN ENGINEERING CO.
MASONIC TEMPLE BLDG. CHICAGO, U. S. A.



Rim is replaced in a minute. Specially designed heels press against the inner side of rim thus locking the rim securely in place.

Lucia AUTO-LOK



The "Auto Lok" is attached to the emergency brake on a level with the operator's knee so that he can open or close it without moving from his seat. When not locked it is out of the way and will not interfere with getting in or out of the car.



Lucia AUTO-LOK

The "Auto Lok" is attached permanently to the emergency brake and when locked, it fastens the gears in a reverse position and clamps the emergency brake on, making it impossible to drive or tow the car in any direction. It opens with a half turn of two locks by simply snapping.

Just What You Have Been Looking For—

AN auto lock that will make your car absolutely thief-proof. The Lucia "Auto Lok" does it. When attached to your car it makes it impossible for anyone to tow or drive it.

The lock is permanently attached to the emergency brake and when locked it fastens the gears in a reverse position and clamps the emergency brake on. Its convenience of locking makes it foolproof—hardly any possibility of forgetting to lock it. Emergency Brake can be set in compliance with city fire regulations.

The Lucia "Auto Lok" is made by skilled mechanics from indestructible drop forgings, extra hardened and mechanically perfect. It is the result of ten months' experimental work, every flaw has been removed and as presented to the public it is "The Perfect Lock." It is furnished in either nickel plate or black enamel finish.

Every car owner wants a lock of this type, and Dealers and Jobbers everywhere are stocking up to meet this demand. The margins of profit on sales of Lucia "Auto Loks" are large. If you have not heard about our sales proposition we advise that you get in touch with us immediately. Write or wire.

Lucia AUTO-PRODUCTS

MANUFACTURING COMPANY Inc.

Park Row Building, New York City



A HAND PUMP IS EMERGENCY EQUIPMENT

It is only used when there is no other supply of air available. If your hand pump goes back on you, there is nothing left to do but limp to the nearest free air station on your rim.

It goes without saying then that every motorist should see that he has as reliable and efficient a hand pump as he can buy.

This is the argument with which you can sell the James Tire Pump to motorists. They can see it is a good pump by looking at it. You can easily show them that it is a pump that can be depended on and one that will take a great deal of the drudgery out of inflating tires by hand.

The big feature of the James Pump is the patented positive check valve. It is so simple anyone can understand and take care of it.

The connections in the James Pump do not leak because they are protected from strain.

Finished in bright enamel with highly polished brass fittings.

It is a profitable pump to sell. Write for literature and discounts.

DESIGNED TO GIVE SATISFACTION



James Combination Grease and Oil Guns Give Satisfaction. They are designed for convenience and long service.

A James Combination Grease and Oil Gun is just what your average customer wants. A real value for his money.

A James Combination Grease and Oil Gun will give him good service and make it as easy and pleasant as possible to attend to lubrication.

It is quickly adjustable for use with either grease or oil. It is of high grade construction. The cylinder is of heavy seamless brass tubing, fitted with bronze cast caps at each end. Cork plunger

The spindle is designed so the grease can be forced out quickly or in small quantities as required.

Furnished in two sizes: 8 and 15 oz.

JAMES TIRE PUMP

JAMES COMBINATION GREASE AND OIL GUN

GENERATOR VALVE CO., Sole Mfrs., 47 Dinsmore Place, Brooklyn, N. Y.

Authorities Agree

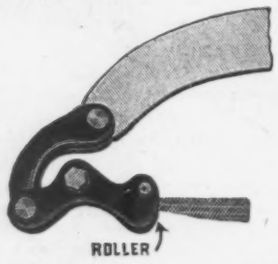
Engineers and merchants in constantly increasing numbers agree that in S & S Shock Proof Equipment the correct principle of shock absorption is carried out perfectly — a principle based on one of the fundamental laws of mechanical engineering, the law of leverage.

This principle is exclusive with S & S Shock Proof Equipment. Ask to see copies of letters of recommendation from car companies, dealers and individuals. They will open your eyes to something you never knew before.

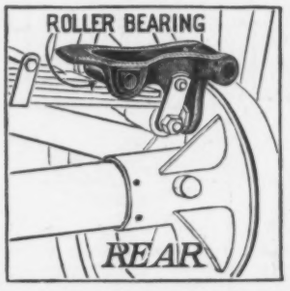
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AUTOMOBILE
TO A
FEATHER BED

Our National Advertising

Campaign starts in February. We are allotting exclusive rights for selling S & S Equipment. Our proposition is an attractive one. Many leading automobile merchants have greatly increased their business with S & S Equipment. Their testimonials are interesting and proof sufficient. Write Dept. C for information.



S AND S
SHOCK PROOF
EQUIPMENT



FOR ALL CARS

Stops shocks. Ride from the sidewalk to the street without a jounce. Ride at any speed over cobblestones, car tracks, deep holes, ripples or any kind of road and S & S Shock Proof Equipment will make all roads seem like macadam. S & S Shock Proof Equipment utilizes a new principle endorsed by users and best engineers. Improves ride-ability of car 100%. Sells at reasonable price. Unique guarantee to users.

FOR FORDS

Full set consists of six absorbers.

Allied Automotive Corporation, General Offices: 1731-1733 Broadway, New York City

Eastern Warehouse: 210 West 54th Street, New York City

Western Distributors: S & S Shock Absorber Co., Prescott, Ariz.

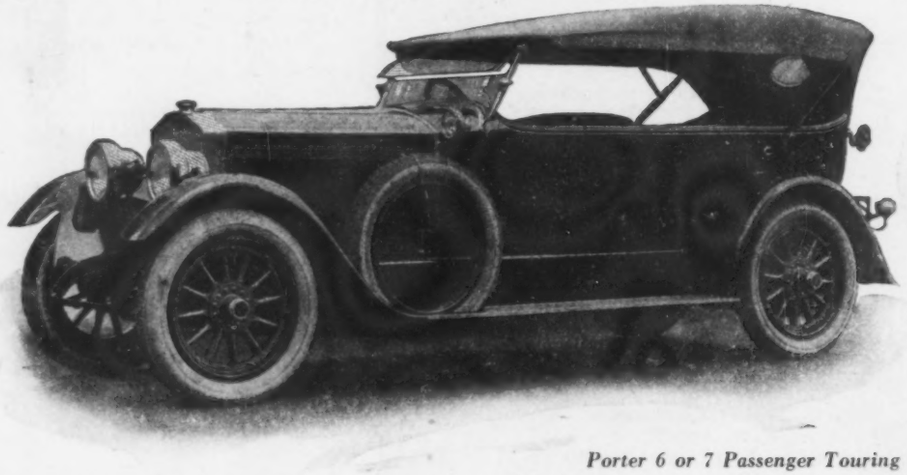
PORTER

The Sensation of the Automobile Salon

Designed by Finley Robertson Porter. *Built by* American and British Mfg. Corp., Bridgeport, Conn.

Chassis 2700 lbs. five cylinders 4.6 x 6¾

HIGH POWERED **16 Valves Overhead, Wheelbase 142 inches** **ECONOMICAL**



Porter 6 or 7 Passenger Touring

Chassis $6750 Delivered in New York. March Deliveries. Six Body Designs.

Open Territory. Write for Full Particulars to

MORTON W. SMITH CO.
SOLE FACTORY DISTRIBUTORS

19 West 44th Street, New York
Telephone 1138 Murray Hill

STOP USING OVERSIZED RINGS!

Put an end to the trouble and work fitting over-sized piston rings—end the uncertainty of knowing whether the refitted motor will be really "leak and oil proof" and have good compression when it's finished! Stop carrying a big stock of piston rings to fit over-size jobs. Find out about

The Whitcomb UNIVERSAL Piston Ring

You can't go wrong on this ring. It's proven its worth in hundreds of motors. It's as leak and oil proof and holds the compression as good and better than any ring you have ever used. And when a motor needs over-sized rings you can use a regular sized Universal Ring and know before you ever install them that the finished job is going to be **right**—with all the work of fitting over-sized rings eliminated. And the reason? Because the Universal Piston Ring is

MECHANICALLY PERFECT

It's a two-piece ring, each piece the same as a one-piece eccentric ring, exact duplicates, so that when they're put together you have a perfect **concentric** ring. This combination gives you the elasticity of the eccentric ring, plus the strength of the concentric ring. You can't improve on this combination.

Dealers—If you'll send us your name and address, we'll show you just why the Universal Piston Ring is better and how it opens the way to bigger profits and more satisfied customers.

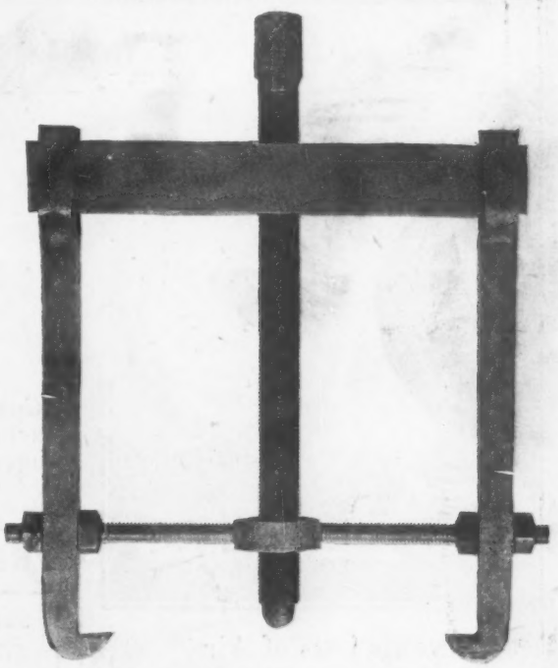


MAIL THIS COUPON
Tell me more about the Universal Piston Ring.
Name .....
City ..... St. Address .....
Signed .....

WHITCOMB MACHINE CO.
MONROE, WIS.

SHEPHERD GEAR PULLER SAVES TIME, LABOR, MATERIAL

The Shepherd Gear Puller is designed for removing gears, sprockets, pulleys, propeller couplings, etc. It is especially made to pull gears where the space around the gears is limited.
Made from the best selected steel; plated to prevent rusting. The jaws slide on the head and are always in a right angle position. This is an important feature because strains naturally follow right angles.
Gear Puller complete, $10.00. Liberal discounts to garages, repairshops and service stations.



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ZIM Auto-Tractor-Aircraft Accessories

208 North Wabash
Chicago, Illinois

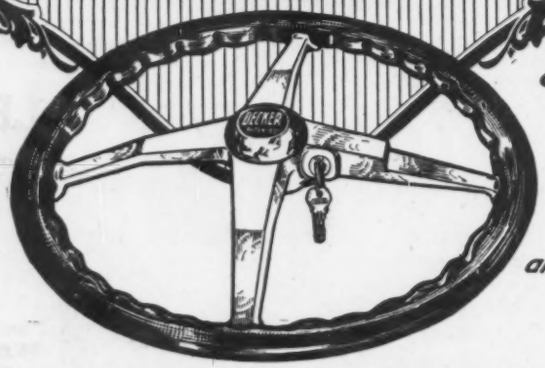
Repairmen:

You cannot do efficient gear work without a Shepherd Gear Puller. And loss of efficiency means loss of profits. Write now for full particulars.

DECKER LOCK-STEERING WHEEL

The Faultless Lock for Fords

Approved by Underwriters Laboratories



A Complete Unit — Steering Wheel *and* Lock Combined

Foil the Thief — Dress Up the Car — Make Driving a Joy

The only practical steering wheel lock is a lock in the steering wheel. Entire mechanism of the Decker Lock-Steering Wheel is imbedded in arm of spider. It is simple, practical and cannot get out of order.

THE LOCK—Yale, of course.

THE WHEEL—17 inch finished rim.

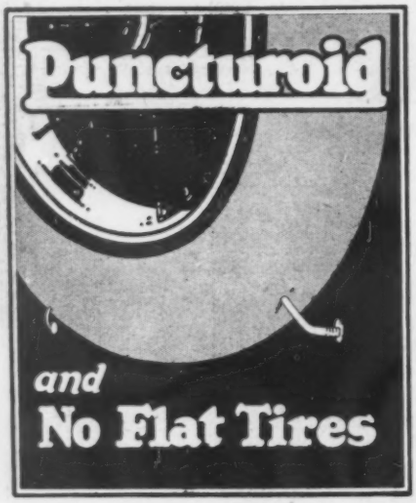
SPIDER—Cast aluminum, highly polished, strikingly handsome.

MODELS NOW READY — Ford Dodge, Maxwell, Chevrolet 490 and Overland 4.

DEALERS: Investigate the Decker Lock-Steering Wheel. It will pay you to do so.

RICHARD M. DECKER COMPANY, 2907 Indiana Avenue, Chicago

BE THE MAN TO SUPPLY YOUR CUSTOMERS



Prevents Loss of Air
Preserves Resiliency
Puts Long Life in Tires
Doubles the Tire Mileage

Mr. Dealer— If You Are Receptive, We Are Prepared to Submit to You

A Most Profitable Proposition

NOTHING MORE REMUNERATIVE IN THE WHOLE CATEGORY OF AUTOMOBILE ACCESSORIES OR SUPPLIES

Do Not Think of **Puncturoid** *As a Tire Filler*

It Coats the Inner Walls of Inner Tubes and Automatically Seals Punctures. It is a Rubber Preservative, Giving Greater Elasticity and Longer Life to Tubes and Casings and Fully Guaranteed.

Good for Car Owners and Their Tires
Good for Dealers and Their Bank Accounts

WRITE OR WIRE AT ONCE FOR FULL DETAILS
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SAVES TIRES TUBES TROUBL

Puncturoid
Puncturoid Manufacturing Company Inc.
(Trade Mark)

SAVES TIME TOIL TEMPER

MARQUETTE BUILDING, CHICAGO

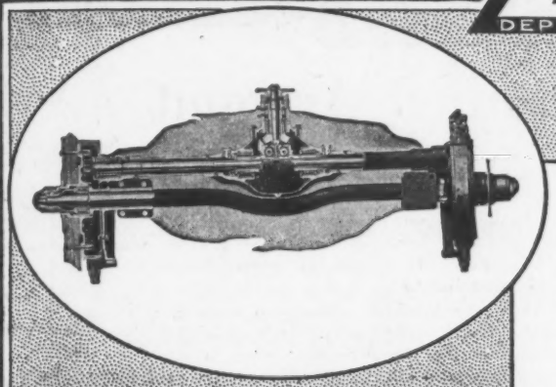
Makes Money for the Man Who Sells It, as Well as the Man Who Buys It

TRI-ANGLE

POWER SERVICE MOTOR TRUCK DEPENDABILITY

A Three-Fold Value

¾ · 1½ · 2 Special & 2½ Ton Models



DEPENDABLE POWER

RIANGLE rear axles do not absorb most of their power—they *transmit* it.

On the whole, they supply to the wheels a greater percentage of actual driving impulse than in any other type of axle. This is particularly so at *slow speed*, where Triangle Trucks are *fifty per cent* more efficient than other types of drive.

"The Powrlock" differential locks both driving wheels together—the wheel having the *greatest* traction receives the *most* power.

Some choice territory is still open. Address or wire, Dept Y.

Eastern Representatives
TRIANGLE MOTOR SALES CO.
381 Fourth Ave. New York City

New England Distributors
Eugene F. Lally and Sons Co.
Boston, Mass.

TRIANGLE MOTOR TRUCK COMPANY
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Approved *by* Underwriters

Cable in all lengths for all cars.

The **JOHNSON UNIVERSAL TIRE-LOCK**
has been fully approved by the
UNDERWRITERS LABORATORIES

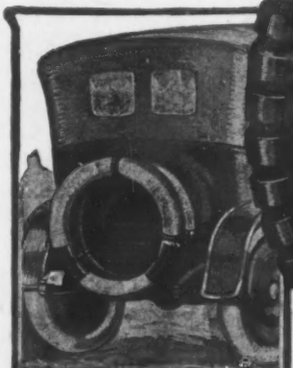
Protect your spare tires with a Johnson, and SAVE $15.00 plus 5% on Insurance.

Dealers wanted everywhere to meet the tremendous demand for this thief-proof lock.

The Edwards Sales Co.
A Selling Corporation
1919 Michigan Blvd.
Chicago, Ill.

Manufactured by
JOHNSON Auto-Lock Co.
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Makers also of the ***JOHNSON Auto-Lock***



Tire lock in place on carrier, fully protecting spare tires.



Sectional view of the armor-steel links that protect the cable against any cutting instrument.



Curing Leaks By Simplified Account Keeping With Akkurate Systems

With two Akkurate system looseleaf books, you have all your accounts, both debit and credit, before you always.

The Akkurate Bookkeeping System records all transactions—your purchases, sales, cash received, cash disbursed, cost, profit and loss, etc.—in one volume.

The self-indexing statement ledger is one simple volume in which a single notation, at time of sale, makes a complete record, even to entry on monthly statement.

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SELF INDEXING STATEMENT LEDGERS

With these two volumes, any subordinate can learn in 15 minutes, how to keep the entire records of your business. You can tell at a glance the exact state of your business.

The Akkurate method saves you time and labor; it minimizes chance for error. It is much cheaper than the cumbersome old-fashioned way of bookkeeping.

We provide also individual forms designed for your own business: Vulcanizing systems, tire tags, repair systems, order forms and the like. Write us for samples.

We will be glad to show you how valuable the "AKKURATE" systems are to every garage and shop. Write us today.

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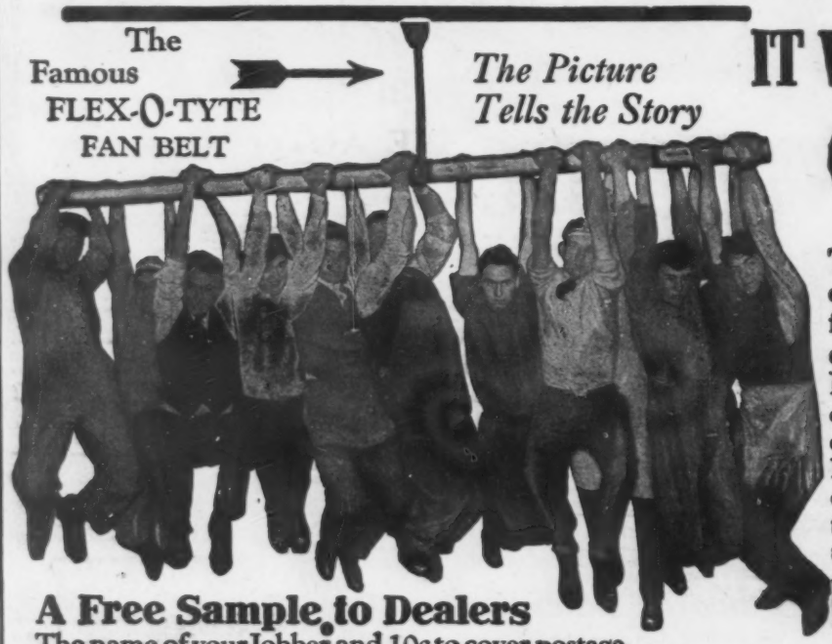
Meet us at the New York Show

Booth D 123, Fourth Floor, Grand Central Palace. You will see the value of "Akkurate Systems" at a glance.

THE WEIGHT WAS OVER A TON

The Famous FLEX-O-TYTE FAN BELT

The Picture Tells the Story



IT WAS THE FAMOUS FLEX-O-TYTE FAN BELT

The strongest, most durable, longest lasting and most satisfactory fan belt made. This is not a mere claim. The famous FLEX-O-TYTE Belt speaks for itself. Built of special Rubber Coated Fabric—wrapped cured. Tougher than leather. OIL, HEAT and WATER-PROOF. No raw edges like the ordinary vulcanized fabric belt, consequently no fabric separation.

A Free Sample to Dealers

The name of your Jobber and 10c to cover postage and packing brings sample belt for late Ford model. Also 32-page Catalog. No obligation on your part.

Dealers—Get Sample

A. J. STEPHENS RUBBER COMPANY

1401 CHESTNUT STREET KANSAS CITY, MISSOURI

"DUPLEX" WINDSHIELD WINGS

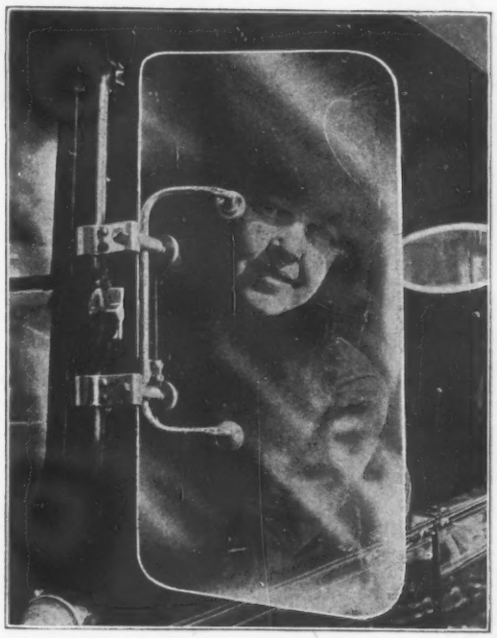
Keep out DUST, DIRT and ANNOYING WINDS

Movable in all directions without ADJUSTMENT.

Add distinction and character to ANY CAR.

Provide the comforts of an ENCLOSED CAR plus the advantages of the OPEN TOURING CAR.

Jobbers and Dealers Write for Details.



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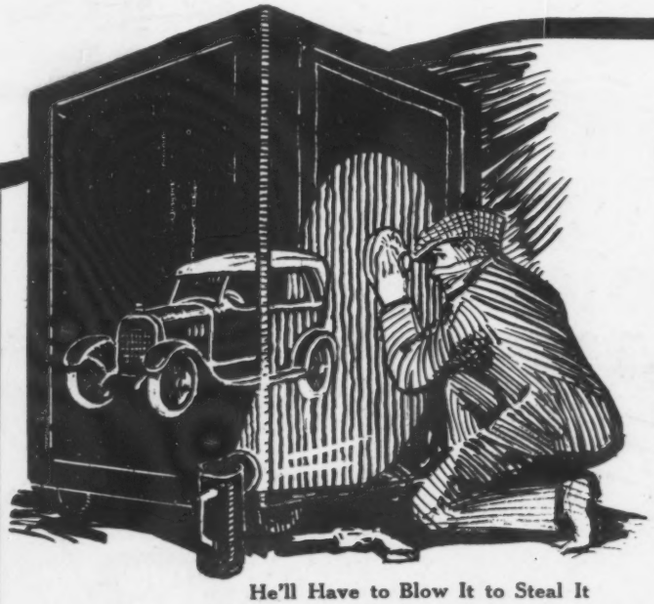
MANUFACTURED BY

Commonwealth Bldg., Denver, Colo.

THE DENVER WING CO., Inc.

333 So. Dearborn St., Chicago, Ill.

SPECIFY "DUPLEX" THEY "INSURE" SATISFACTION



He'll Have to Blow It to Steal It

SAFE AS IF IT WERE IN A SAFE

IT'S EQUIPPED WITH EVER-SAFE AUTO LOCK

Ever-Safe Auto Lock insures car owners from theft even against the most skillful thief. They have to blow up the Ever-Safe locked car in order to break the lock.

The Ever-Safe is fast becoming recognized as the best automobile lock on the market. The Ever-Safe Company wants a progressive dealer in each locality, to carry on to prosperity with them.

Car Owners Willingly Pay For Safety

The average motorist wants to know he will find his car just where he left it—and he is willing to pay for the protection. Ever-Safe Auto Lock will give him that protection and it will give you good profits.

Ever-Safe Auto Locks present an unusual opportunity for progressive dealers to realize big profits. Write or wire us for details.



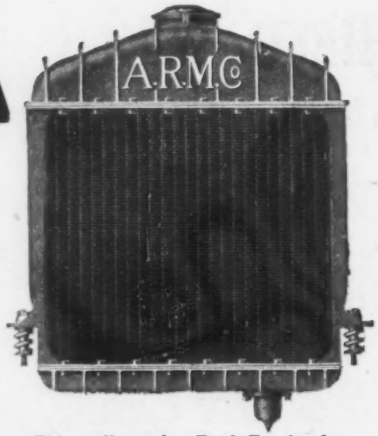
EVER-SAFE AUTO LOCK CO., Inc., St. Paul, Minn.

1161 University Avenue

Zig Zag RADIATORS



The Zig-Zag 1917-1920 Radiator for Fords with Black Enameled Steel Shell.



This radiator for Ford Trucks fits all models 1917 to 1920. Cast Iron Tanks, Oval Brass Tubes. Note Spring Suspension which protects radiator from road shocks and prolongs its life.



This is our Zig-Zag Chevrolet model 490 radiator with drawn one piece steel shell. Fits all models 1915 to 1920.

Radiators That Keep Motors Cool

The expenditure of thousands of dollars for dies enables us to offer this radiator for Chevrolets. It is beautifully enameled without usual extra enameling charge.

Dealers: You will find quality of product and generous profits the keynote of your dealings with the Auto Radiator Mfg. Co. If your jobber can't supply you, write for our complete radiator catalog.

AUTO RADIATOR MFG. CO. 1712-1714 S. Michigan Blvd., CHICAGO, ILL.

The FORE one-piece piston ring



An automobile motor is as efficient as its piston rings. Unless the rings make the piston absolutely gas tight, formation of carbon on the cylinder wall and consequent loss of power will result.

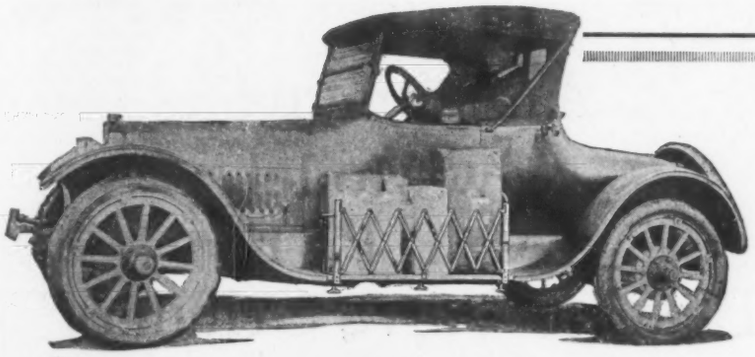
The scientific construction of the Fore Piston Ring makes it positively gas tight, oil tight, and compression tight.

Dealers: Get in line now for your share of the excellent Fore profits. Wire or write at once for our generous dealers' proposition.



The Fore Piston Ring Slip On saves time in installing piston rings, and eliminates danger of breakage.

Fore Electric Mfg. Co., Inc.
5811 Easton Ave., St. Louis, Mo.



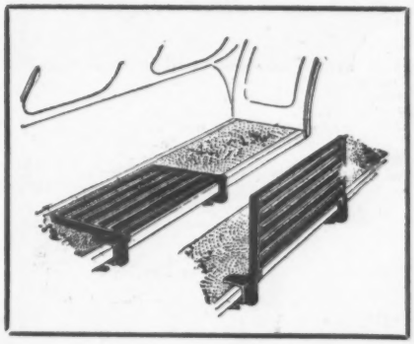
STANDLEY ADJUSTABLE LUGGAGE CARRIER

Every car owner can use this luggage carrier to great advantage many times a year. Folds up compactly under seat, when not in use—opens any length from 10 to 65 inches and forms a basket on the running board when attached. No tools necessary to put on or adjust to any size package. Takes only a moment. A great convenience whenever any baggage or packages are carried and invaluable when touring.

TWO ACCESSORIES THAT BELONG IN EVERY STOCK

Running Board Safety Tread

Adds to the appearance of any car—prevents slipping on running board and provides a place to scrape mud and snow from the shoes. Easily attached—easily cleaned—keeps dirt and mud out of the car at all times.



STANDLEY

- Rim Tools
- Camp Grids
- Running Board Supports
- Truck Chains for Fords
- Radius Rod Supports
- Bolt Anchors

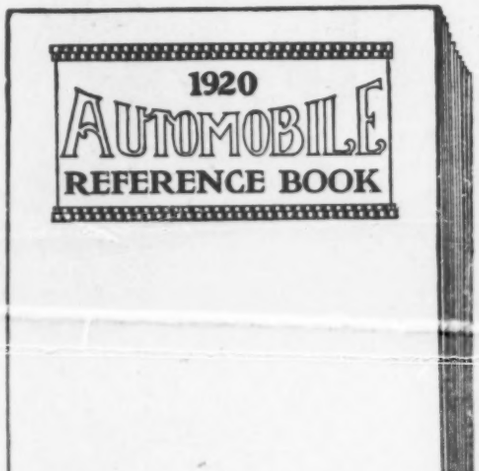
There is a demand for these two accessories everywhere—the safety tread selling strongly during the winter season and the luggage carrier reaching its high point during the touring season. Both are designed and finished to add to the appearance of the car and sell themselves wherever introduced. Stock from your favorite jobber or write us direct.

STANDLEY SKID CHAIN CO.

BOONE, IOWA, U. S. A.

READY FOR DISTRIBUTION

Larger and better than ever



FACSIMILE OF BOOK REDUCED TO ONE-QUARTER ACTUAL SIZE

To see this book is to want one

Could not supply the demand on our 1919 book. So get your order in early

Just twice the size of our 1919 book, 256 pages and cover. This book shows in picture form the location of the Motor and Serial numbers on all passenger cars and trucks and gives the Serial numbers by model and Years from 1914 to date.

This is the book you cannot be without. If you have ever had occasion to buy a second-hand car you can remember how you have tried to guess at the year the car was made in. All this can be eliminated by just referring to our book. It will also help you in ordering parts and in many other ways. We have made it so valuable this year that every garage, dealer or jobber in the country will want one of these books. GET YOUR ORDER IN NOW! ONE DOLLAR A COPY.

Remittance Must Accompany the Order.

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Ben P. Branham Printing Co. Dept.
AUTOMOBILE DIVISION
951 Insurance Exchange, Chicago

Insurance Field
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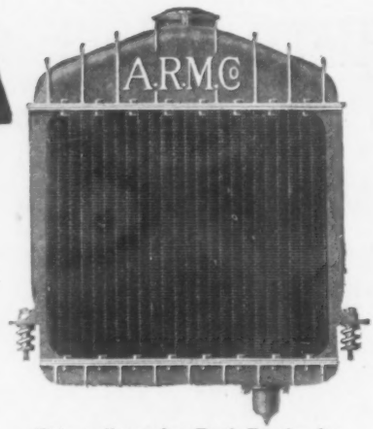
Gentlemen: Enclosed find $..... Please send .....Copies of 1920 AUTOMOBILE REFERENCE BOOK.

Name .....
Street No. .....
City and State .....

Zig Zag RADIATORS



The Zig-Zag 1917-1920 Radiator for Fords with Black Enameled Steel Shell.



This radiator for Ford Trucks fits all models 1917 to 1920. Cast Iron Tanks, Oval Brass Tubes. Note Spring Suspension which protects radiator from road shocks and prolongs its life.



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AUTO RADIATOR MFG. CO. 1712-1714 S. Michigan Blvd., CHICAGO, ILL.

The FORE one-piece piston ring

Gas Tight

Compression Tight

Oil Tight



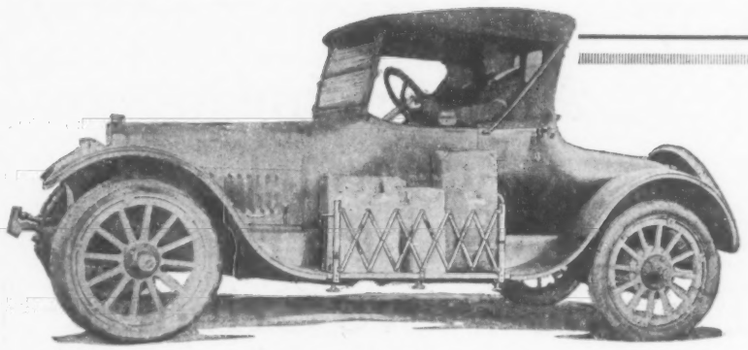
The Fore Piston Ring Slip On saves time in installing piston rings, and eliminates danger of breakage.

An automobile motor is as efficient as its piston rings. Unless the rings make the piston absolutely gas tight, formation of carbon on the cylinder wall and consequent loss of power will result.

The scientific construction of the Fore Piston Ring makes it positively gas tight, oil tight, and compression tight.

Dealers: Get in line now for your share of the excellent Fore profits. Wire or write at once for our generous dealers' proposition.

Fore Electric Mfg. Co., Inc.
5811 Easton Ave., St. Louis, Mo.



STANDLEY ADJUSTABLE LUGGAGE CARRIER

Every car owner can use this luggage carrier to great advantage many times a year. Folds up compactly under seat, when not in use—opens any length from 10 to 65 inches and forms a basket on the running board when attached. No tools necessary to put on or adjust to any size package. Takes only a moment. A great convenience whenever any baggage or packages are carried and invaluable when touring.

STANDLEY

Rim Tools
Camp Grids
Running Board Supports
Truck Chains for Fords
Radius Rod Supports
Bolt Anchors

There is a demand for these two accessories everywhere—the safety tread selling strongly during the winter season and the luggage carrier reaching its high point during the touring season. Both are designed and finished to add to the appearance of the car and sell themselves wherever introduced. Stock from your favorite jobber or write us direct.

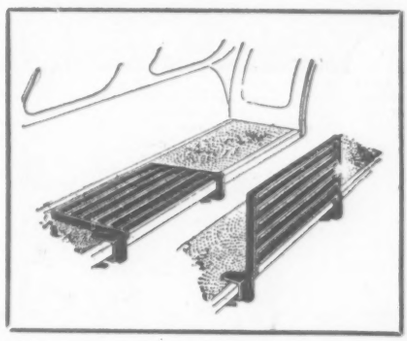
STANDLEY SKID CHAIN CO.

BOONE, IOWA, U. S. A.

TWO ACCESSORIES THAT BELONG IN EVERY STOCK

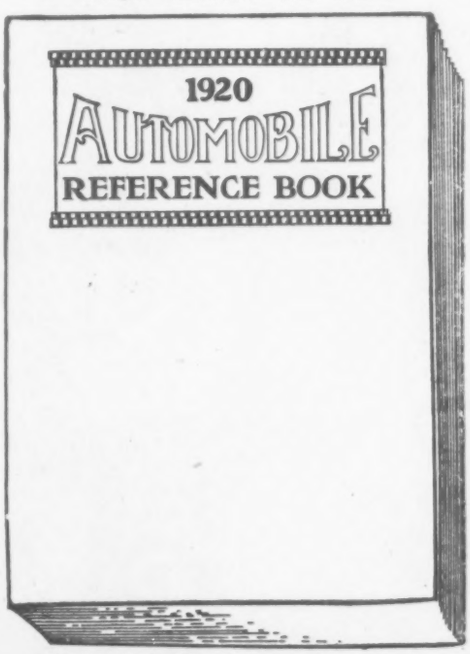
Running Board Safety Tread

Adds to the appearance of any car—prevents slipping on running board and provides a place to scrape mud and snow from the shoes. Easily attached—easily cleaned—keeps dirt and mud out of the car at all times.



READY FOR DISTRIBUTION

Larger and better than ever



FACSIMILE OF BOOK REDUCED TO ONE-QUARTER ACTUAL SIZE

To see this book is to want one

Could not supply the demand on our 1919 book. So get your order in early

Just twice the size of our 1919 book, 256 pages and cover. This book shows in picture form the location of the Motor and Serial numbers on all passenger cars and trucks and gives the Serial numbers by model and Years from 1914 to date.

This is the book you cannot be without. If you have ever had occasion to buy a second-hand car you can remember how you have tried to guess at the year the car was made in. All this can be eliminated by just referring to our book. It will also help you in ordering parts and in many other ways. We have made it so valuable this year that every garage, dealer or jobber in the country will want one of these books. GET YOUR ORDER IN NOW! ONE DOLLAR A COPY.

Remittance Must Accompany the Order.

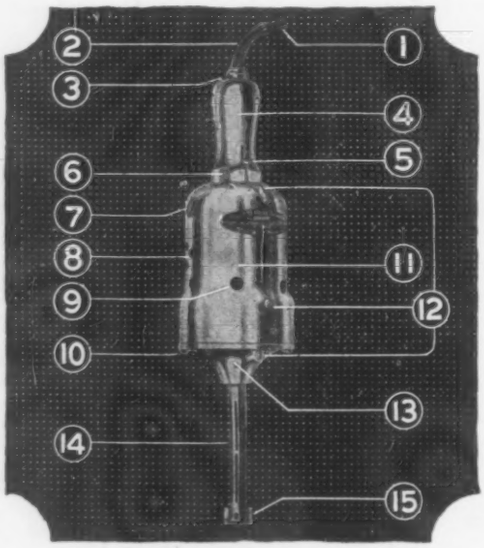
INSURANCE FIELD

Ben P. Branham Printing Co. Dept.
AUTOMOBILE DIVISION
951 Insurance Exchange, Chicago

Insurance Field
Ben P. Branham Printing Co. Department Automobile Division
951 Insurance Exchange, Chicago

Gentlemen: Enclosed find $..... Please send .....Copies of 1920 AUTOMOBILE REFERENCE BOOK.

Name .....
Street No. .....
City and State .....



1. Flexible cord
2. Wire cord protector
3. Cord clamp nut
4. Detachable handle
5. Trigger switch
6. Handle clamp screw
7. Accessible brush holders
8. Motor ventilating holes, intake
9. Motor ventilating holes, exhaust
10. Six flange screws
11. Main housing
12. Oilers for three bearings
13. Cover flange
14. Oscillating and rotating shaft
15. Valve bit

Announcing New Model ECLIPSE Electric Valve Grinders

The Eclipse Electric Valve Grinder combines the rapid and positive back and forward movement necessary to do the grinding, and the slow rotary movement for continually turning the valve to a new position and insuring uniform grinding.

"It is light in weight, of ample power and has been tried and proved in long service to be a sensible, practicable device which, in your shop, will mean time and money saved."

Sales are made only through recognized jobbers. If your jobber cannot supply you, write direct and send us his name. Order now because our factory is being rushed to the limit to keep up with the demand.

ECLIPSE VALVE GRINDER CO.
GATEWAY STATION KANSAS CITY, MO.

The Most Remarkable Automobile Top Material

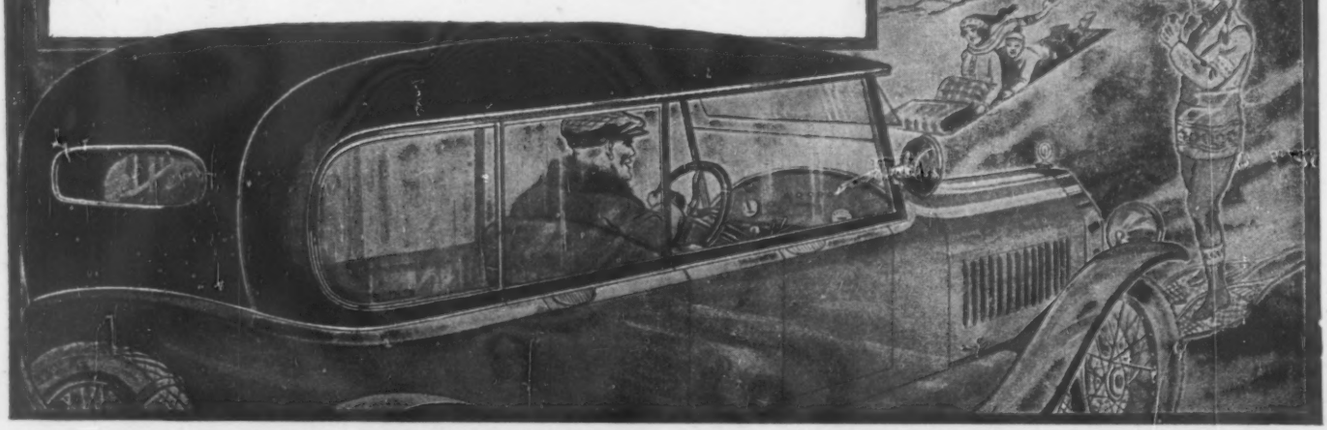
LIGHT IN WEIGHT
DEPENDABLE IN QUALITY
NON-CRACKING— NON-BLISTERING

Dridek Is Made to Satisfy

Send to Dept. S for Samples and Prices

L. J. MUTTY CO., Boston, Mass., U. S. A.

TRADE DRIDEK MARK REG



The Johnson Adjustable Piston Ring Expander Saves Your Time—Money—Rings—Labor



The Johnson Adjustable Piston Ring Expander simplifies former methods of putting piston rings on a Piston and **eliminates breaking of rings.**

Fits Any Piston Ring

The Johnson Adjustable Piston Ring Expander is the only expander made which automatically adjusts itself to **any make or size** ring from 2½ to 4½ inches. **It would be impossible to make a piston ring that this expander would not handle.**

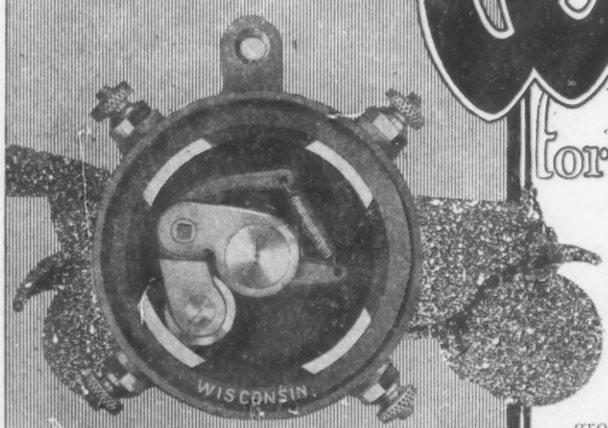
Handles Four Rings

It is made to handle four rings at one time. The expansion band is made from hardened and resilient steel. The handle is made of stamped steel.

THE JOHNSON SPECIALTY COMPANY Incorporated **Madison, Wis.**

Wisconsin TIMER

for Ford Cars Trucks and Tractors



PRICE $2.00

IN CANADA $2.50

Positive Protection from Ignition Troubles

Thorough workmanship, quality materials and careful inspection methods make this timer a piece of mechanism that operates perfectly all through a long life. All working parts are polished and ground. All measurements are exact.

The following description indicates the high quality of this timer.

THE SHELL—Stamped from high grade nickel finished steel.

THE FIBRE—Grey, bone dry, positively will not absorb oil. Pressed in shell under hydraulic pressure; fits tight so no oil can get behind ring to "short." Wears even and smooth-roller will never jump contact points.

Our Dealer Proposition Is Attractive. Write for Details.

WISCONSIN TIMER MFG. CORP.
MENOMONEE FALLS, WISCONSIN
Sales Department—J. Wadsworth Staff
122 S. Michigan Blvd., Chicago

EMO

$1.00



EMO Transformers are used by thousands on Automobile Engines, Airplanes, Trucks, Tractors, Motorcycles, Marine and Stationary Engines. Results in bettering the ignition are astounding. EMOS transform the slow, faint spark of the ordinary plug into a high-tension blue-white flash of fire that instantly ignites the vapors from even the lowest gravity fuel; it increases the power wonderfully; it increases gasoline mileage; decreases the carbon troubles and makes for easier starting, quicker acceleration.

The EMO user is assured of greater driving comfort regardless of weather conditions. No matter what system of ignition, plugs, make of battery or magneto you are using—EMO Transformers will do wonders for you by merely attaching one to each plug.

DEALERS.—The demand for EMOS is increasing daily. We are alloting territory—be first to sell EMOS in your locality. Write us for details. Retails for $1.00 each—sent prepaid upon receipt of price.

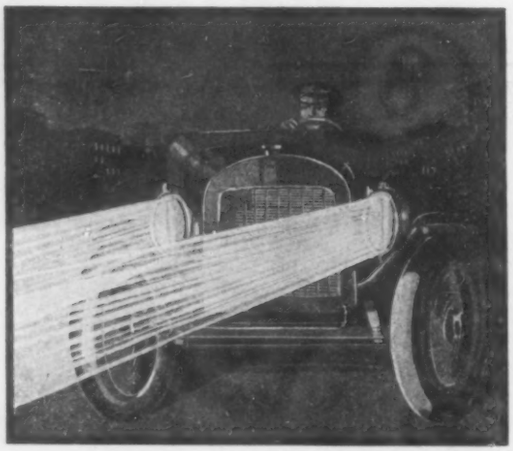
Southern States Distributors
THE E. & M. SUPPLY CO.
11 American Bank Bldg.
Huntington, W. Va.

Manufactured by
THE EMO LABORATORIES
2255 N. Illinois St., Indianapolis, Ind.

Export Agents
CENTRAL STATES EXPORT CO.
203-204 Traction Bldg.
Indianapolis, Ind.

TRANSFORMERS

"SAFETY"
DIRIGIBLE-HEADLIGHTS



Light the Road at ALL times BEFORE approaching. They make driving a PLEASURE and add greatly to SAFETY and SPEED for night driving.

NOW READY FOR FORDS

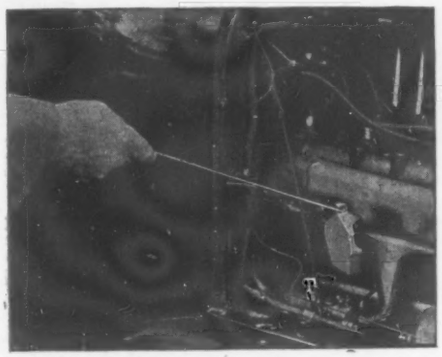
Price.....$8.75

Easily attached, no alterations, cannot rattle, never out of order. Send $2.50, balance C. O. D. 5% allowed for cash with order. Dealers, Agents, write.



A necessity, scientifically designed, thoroughly proven, hundreds in use.

HOFWEBER MFG. CO. 127 SO. FRONT ST., LA CROSSE WIS., U. S. A.



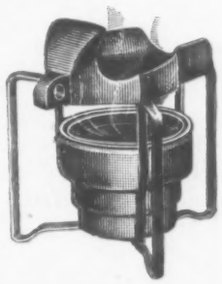
Patented June 24, 1919

Simple and convenient.
No installing.
No flame under hood.
Safe and sure.
Money back guarantee.
Price complete to car owners, post paid, $1.50.
To Dealers, $1.00.



Illustration shows the One Minute Manifold Heater being heated by the can of heat, a very convenient method when on the road or without other means of heating. One can will heat Manifold Heater fifteen or eighteen times. Heat replaced at hardware and department stores for 15c.

Illustration shows method of heating One Minute Manifold Heater in range. It should be heated on live coals two or three minutes or until red hot.



One Minute Manifold Heater Helps Fords Start in Winter

The ONE MINUTE MANIFOLD HEATER consists of a cast block aluminum finish, weighing about one pound, that fits snugly on intake manifold, a detachable handle, can of heat, and folding stand.

Hundreds sold last winter—every buyer a booster—can be placed on manifold when heated to a cherry red. You know what that will do to the gas coming up from the carburetor—a hot, easily ignited vapor—not once, like priming, but a continuous flow.

Put heater on handle, place on live coals in range, furnace, stove, or upon gas stove, or in emergency use can of heat furnished. After two or three minutes, when placed on live coals, or five to six minutes when using can of heat, take heater out and place on intake manifold.

After one minute the manifold will be so hot that all gas passing from carburetor through it will be made into a hot vapor. (The motor not only starts easy, but runs good from the start). Saves time, your disposition and your battery if using a starter.

The Heater is cast so that it will stay on manifold and should be left there, as it will absorb heat from the exhaust manifold and hold it for another start.

J. C. Kempf, Traffic Manager of FORD MOTOR CO., St. Louis, Mo., says:

"The recent extreme cold spell has given me an opportunity to test the advantages claimed for your One Minute Manifold Heater, and I am highly pleased to report that in each instance that it was used same proved beyond a doubt entirely satisfactory. Under such favorable conditions the writer could not justifiably hesitate in recommending the use of your heater to anyone who may be in the market for a contrivance so handy and practical."

(Made for Ford cars that have the regular Ford intake manifold. No. 1 for all late model cars—No. 2 for old style aluminum manifolds.)

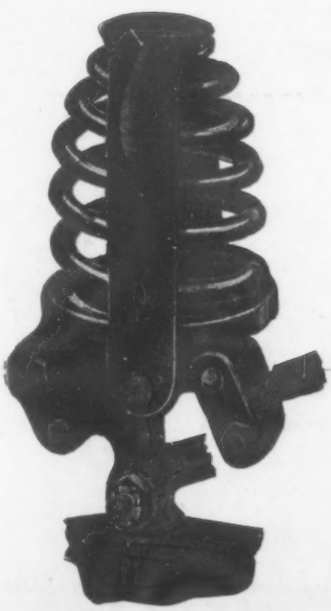
Dealers: Hundreds are making a clean-up on this seasonable accessory. Give your jobber's name when ordering.

KENDALL MANUFACTURING CO.

Illiopolis, Ill.

HALLADAY

Direct Suspension Shock Absorber



DO YOU KNOW WHAT DIRECT SUSPENSION MEANS?

It means that the entire weight of the car is directly suspended on four sensitive springs of sufficient capacity to take the jolts, jars and vibrations out of the roughest traveling.

It means that the load is carried on the ends and the centers of the leaf spring and nowhere between these two points is there any strain that can bend or break the spring.

The Halladay spring is of the famous "Bee Hive" type which is by far the most resilient and longest lived spring ever made. A set of Halladays on your Ford Car will not only add tremendously to the pleasure of driving but will cut down upkeep costs considerably.

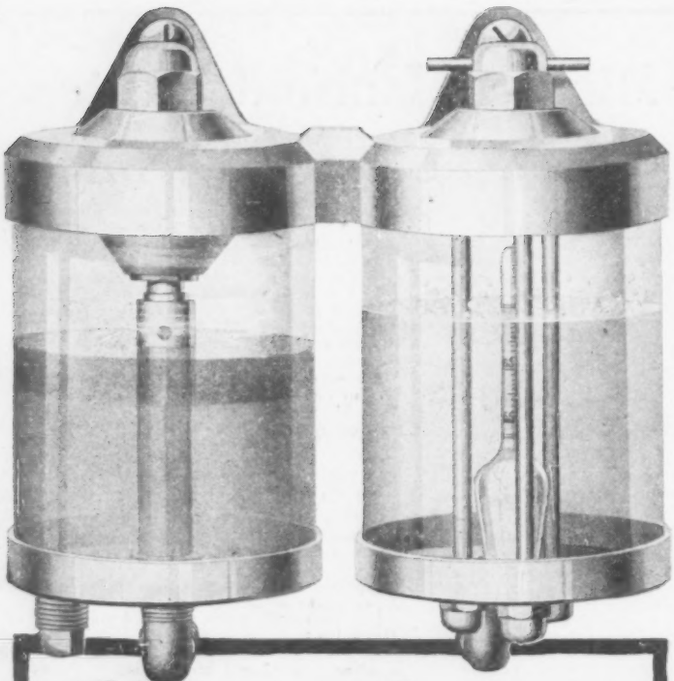
Price per set.....$15.00

Dealers: Write us today; our proposition is exceptionally interesting.

L. P. HALLADAY COMPANY

Manufacturers of Bumpers, Shock Absorbers and Automobile Accessories

520-530 Monroe St. Streator, Illinois



Gas-co-lator

VISIBLE GASOLINE FILTER

Overcomes Every Gasoline Trouble

Put the Gas-co-lator on your Instrument Board

Watch this combined filter, separator and percolator taking every impurity out of the gasoline supply and you'll have enough dirt, rust and water in the left barrel to convince any car owner of the necessity of a real **gasoline cleaner.**

Dirty gasoline causes a lot of inconvenience and frequently serious trouble. The Gas-co-lator ends it—keeps the carburetor working perfectly at all times—ends coughing, spitting and misfiring of the motor, and adds to the pleasure, economy, speed and safety of motoring.

YOU CAN'T BUY CLEAN GASOLINE

Clean gasoline will make any car perform better than the kind you can now buy—the Gas-co-lator purifies every drop before it goes into the carburetor "right before your eyes." It is sturdy, and handsome dash instrument with a real purpose which it efficiently fulfills, costs but a few dollars, and appeals to every car owner who seet it in operation.

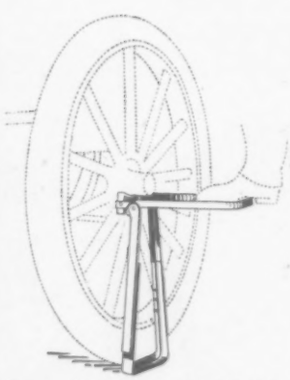
DEALERS:
The Gas-co-lator proves its merit conclusively and sells easily on a "visible proof" basis. Write for complete details and discounts on this attractive sales proposition.

VISIBLE GASOLINE FILTER CO.

724 So. Wabash Ave. CHICAGO, ILL.

OSHKOSH TIRE SAVING JACKS

Prolong the Life of Your Tires



First—Center Jack under hub—press down with foot—Regular No. 1 Adjustable.

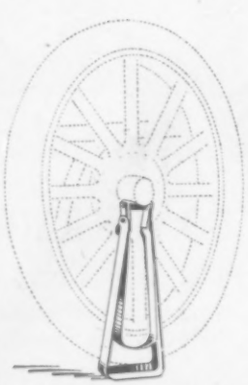
Every time your car stands in the garage on its tires—if it's only over night—their mileage *shrinks.*

The heavy weight of the car rests entirely on the tires—the fabric gradually gives under the strain—and pretty soon you have to buy new tires.

Oshkosh Tire Saving Jacks *double* the life of your tires by taking *the full weight* of your car on their powerful shoulders—and off your tires.

Simple Construction
Tremendous Lifting Power

Its simple construction is clearly shown in the accompanying illustrations. Its case of operation—simply centering it under the hub and pressing down with the foot to raise car and lock Jack—is such that a *child* can readily operate it.



Ford Size 30x32 inch wheels. Second—and car raises as Jack locks automatically.

Save your tires—ask your dealer for Oshkosh Tire Saving Jacks—or order direct from us.

Ford Size 30x32 inch wheel, $3.50, set of four.

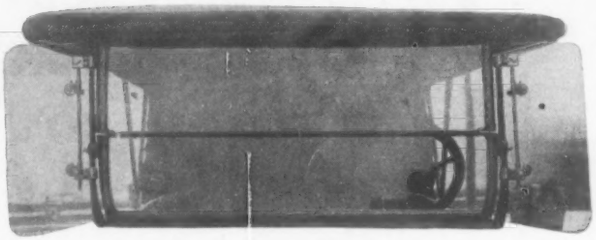
No. 1 Adjustable to any size wheel, $4.50, set of four.

Dealers—Your customers will thank you for suggesting the use of these real money-savers. Write for particulars.

OSHKOSH AUTO SPECIALTIES CO.

Incorporated

Oshkosh, Wisconsin



NATIONAL WINDSHIELD WINGS

Defy Wind, Dust and Rain Keep Out Cold Air. Add Character and Distinction to Your Car

SIX REASONS WHY NATIONAL ARE BEST

1. Auxiliary Windshield Post overcomes all windshield post irregularities, by allowing to swing like a door with two fasteners and still adjustable to any position without use of a wrench.

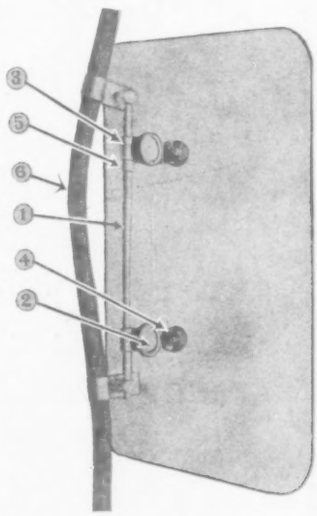
2. Two set buttons positively hold it in desired position.

3. Clamp around auxiliary post being one continuous loop, gives brake-drum grip.

4. Bolts through glass, well rubber cushioned, makes flexible contact point.

5. Positive Stop Collar can be set to any desired positive stop position. This keeps Wing from striking windshield, and allows motorist to keep light tension on buttons, permitting free oscillation of wing.

6. Windshield Post—There is no post too irregular to be equipped with the National.



JOBBERS AND DEALERS: You will find a big market among particular motorists for National Windshield Wings—they are the last word in motoring comfort. They protect motorists from dust, dirt and annoying wind and at the same time add a note of distinction to any car. Write for our attractive proposition.

EMIL J. KRIMSKY

1305 Michigan Ave. Chicago, Ill.

Battery Charging Your Biggest Money-Maker

Garages, Large or Small, Can Get a Share of the Big Profits From Battery Charging

This big money-making business is open to every live garage man. Wherever cars are driven, there are batteries to be recharged and customers are demanding high grade, efficient battery charging service. Get in the game, get the big profits that battery charging pays. No other part of your garage business pays anything like as big profits. With HB Equipment, it costs you only 10c to 15c to charge a battery and the customer pays 75c to $1.50. Compare that profit with profits from other lines of your business. Battery charging can be made to pay from $100 to $350 a month. The business is at your door—go after it.

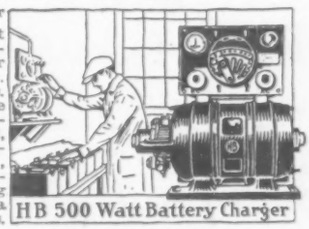
An HB Battery Charger for Every Size Business

You can get an HB Charger in any size you need. All HB Chargers are sturdy, dependable and absolutely reliable. Built of finest materials obtainable. Nothing to burn out, no expensive renewals or repairs. Plain, honest, profit-producing service 24 hours a day. No electrical or mechanical knowledge required to install or operate. No attention except occasional oiling. Use power from city lines now in your garage. Big, quick, clean profits, easily made.

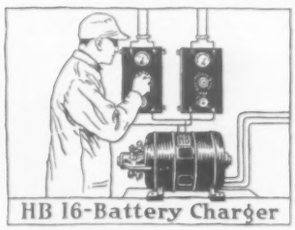
Choose the Size You Need

HB 500 Watt Charger

Recharges 1 to 8 6-volt batteries or their equivalent at a time. Charger is 27 in. long, 26 in. high, weighs 280 lbs. Furnished complete with clear black electrical slate switchboard, with mountings of ammeter, field rheostat, voltage, lamp, two controlling switches. A big money-maker for a small battery business.



$15 Cash—Balance on Easy Monthly Terms



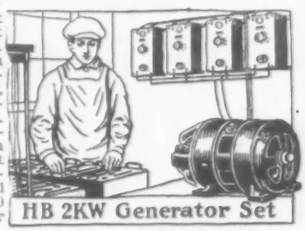
HB 16 Battery Charger

Recharges 1 to 16 6-volt batteries or equivalent in 12 or 24-volt batteries at once. Motor 1 KW. capacity. Operates on 2 or 3 phase current only. Furnished complete with 2 independent charging panels, each with capacity of 8 batteries. A splendid machine for every live, energetic garage owner wishing to get big profits.

Small Cash Payment—Balance on Easy Monthly Terms.

HB 32 Battery Charger

Recharges 1 to 32 6-volt batteries or equivalent at a time. Motor 2 KW. capacity. Operates on any current. Four separate charging lines, each capable of charging up to 8 batteries. Permits individual attention to batteries on charge. Ideal equipment for big garage or battery service station. Will make as high as $250 to $350 a month Clear Profit.



Small Cash Payment—Balance on Easy Monthly Terms.

Sold on Trial Under HB Absolutely Money-Back

All HB equipment is sold under our absolute guarantee of complete satisfaction. If not satisfied after using any HB Equipment 10 days, you may return it and receive all you paid us. The HB monthly payment plan is an additional guarantee. Machines easily pay for themselves out of earnings.

HB Chargers Are the Motor Generator Type

There are many charging appliances on the market which on first impression look good. But before you buy them, investigate the operating expense and the cost of parts that wear out or burn out, causing needless trouble, worry and needless expense. It should mean something to you that 75% of all HB Motor Generator Chargers sold replace other charging appliances. Remember, it is not first cost that is so important to you as the monthly bills for current, repairs, renewals, etc. Remember you are buying a battery charger for years of hard service. Get an HB Motor Generator Charger and be free from all expense and trouble. HB Motor Generator Chargers are sturdy, dependable and last for years under hardest usage. If in doubt, write us for full data on various types of battery chargers. Buy your Charger for Long Service and Big, Steady Profits. You run no risk with an HB Charger. Write today for information.

HOBART BROS. CO.

Successful Manufacturers Since 1893

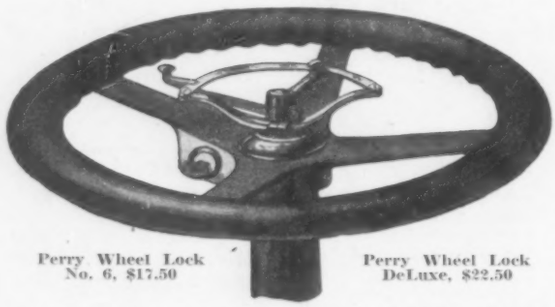
BOX A-14 TROY, OHIO



Safe—

thanks to my PERRY AUTO LOCK

There is nothing to fear from the auto thief if your car is equipped with the Perry Auto Lock. Simply turn the key that controls it, the wheel drops down from the hexagon driving post, spinning free, until such time as you use your key to lock it back into driving position. There is a Perry Auto Lock for every make of car. Ask your dealer to put one on your machine today.



Perry Wheel Lock No. 6, $17.50

Perry Wheel Lock DeLuxe, $22.50

The wheel shown above is our No. 6. Very popular with car owners everywhere. If your dealer doesn't have it, write us for name of one near you who does.



The PERRY LOCK For Ford Cars

Ford car owners will find positive protection in the Perry special, sold by dealers everywhere for $7.00.

Go to Your Regular Dealer for Perry Locks Or Write for Circular Today.

PERRY AUTO LOCK CO.
2635 S. Michigan Ave.,
CHICAGO, ILL.

THE average car tool kit is a joke except when you need to use it—and then it's a tragedy.

There, are, however, some wise car makers who equip their cars with good tools—and you know what it means to you when you enjoy the service of such kits.

The Billings & Spencer Company are wrench makers and have been preeminent in this field for fifty years. Manufacturers the world over recognize Triangle B as the standard for quality.

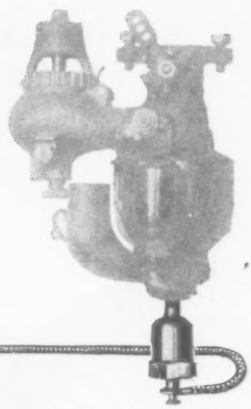
That little mark says "Rely on me. I am made as well as I can be made. I shall not fail."

A dealer or a garage man without B. & S. wrenches is almost a curiosity, for satisfied customers are their biggest asset — and the most satisfaction comes from using tools that make good where the service is the hardest.

"Great Western"

Carburetor Heater Makes Starting Easy In Winter

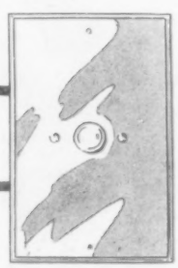
Cold gasoline is the chief cause of winter starting troubles — the gasoline will not vaporize quickly. The GREAT WESTERN CARBURETOR HEATER vaporizes gasoline in 45 seconds—insuring a quick start and steady efficient explosions of the motor.



Boils the Gasoline

The heater can be attached quickly to any make carburetor. It operates on current from the storage battery and is controlled from the dash.

Dealers: *Right now* is the time to stock up on this easy seller. A demonstration makes a sale nearly every time. We sell direct to dealers, eliminating the jobber—and his profits. We share the jobbers' profits with you. That's why the profits are unusually generous. Write.



"Great Western"

Commercial Body Co.

$7.50 Omaha, Neb.



USE THE COUPON

Great Western Commercial Body Co.,
Omaha, Nebraska.

Gentlemen: Forward full particulars and best dealer's selling plan by return mail.

Name .....

Address .....



"—and reline the brakes with Garco"

This is overhauling time—when cars are tuned up for the 1920 season. Now the car owner has time for reflection—on the vital responsibility carried by a brake lining. Now is when he wants the "best".

ASBESTOS PRODUCTS

Packings
Locomotive Throttle and Air Pump Packings
High Pressure Piston Packings
Valve Stem Packing
Medium and Low Pressure Packings
Perfect Valve Rings
Flax Packings
High, Low and Medium Pressure Sheet Packings
Gasket and Gasketing Material
Asbestos Wick and Rope

Asbestos Automobile Specialties
Brake Lining
Transmission Lining for Fords
Cone Clutch and Disc Clutch Facings
Asbestos Spark Plug Yarn

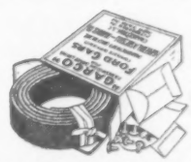
Asbestos Textiles
Cloth Yarn Cord
Carded Fibre Braided Tubing

He may leave the matter of "best" to your judgment. Or he may demand it by name. In either case have Garco ready. Garco satisfies both the customer and your conscience.

Specially selected long-fibre asbestos. Fine wire reinforcement twisted into every strand. Impregnated with a special friction compound that carries never-let-go insurance down to paper-thin thickness.

Garco never burns, never becomes hard, never deteriorates, never falls apart. It is absolutely dependable and long-wearing.

This is a good time to get going with Garco. Write for proposition and how we help you sell Garco.



Garco Transmission Lining for Ford Cars



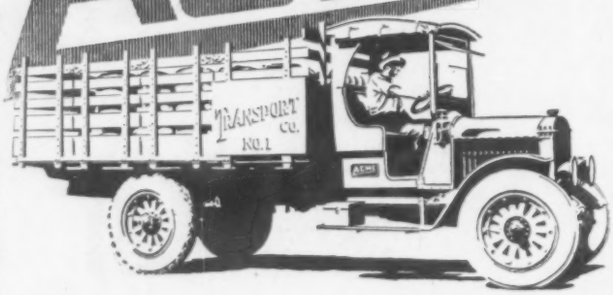
Garco Gaskette Roll

GENERAL ASBESTOS AND RUBBER CO.
Main Office and Factories
CHARLESTON, S. C.

Branches and Complete Stocks
58 Warren Street, New York
14 North Franklin Street, Chicago
311 Water Street, Pittsburgh

GARCO
ASBESTOS
BRAKE LINING

ACME



Do Figures Mean Anything to You?

Eight hundred out of every one thousand Acmes were bought because owners had confidence in Acme proved units and Acme proved construction. They knew that the industry's leading units as selected and assembled by Acme engineers gave them definite assurance of complete satisfaction in service and performance. Over 990 out of every 1,000 owners of Acmes in service say that Acme is superior—and the number of owners who will add Acmes to their fleets shows an amazingly high percentage.

We Have the Facts

Every Acme truck in service has been investigated. We know that Acme proved units and Acme proved construction have placed truck purchasing on a new basis. They offer to progressive dealers known standards upon which to build an increasing and profitable truck connection.

Acme dealers not only have a truck that stands out conspicuously in the entire field in service and performance—but they are armed with facts about Acme that make the Acme franchise one of the most desirable of the times. Write for catalog and information on our proposition.

Built in 1, 1½, 2, 3½ and 5 ton models

Bodies built in Acme factories

ACME MOTOR TRUCK COMPANY

236 Mitchell St., Cadillac, Mich.

The Seal of Dependable Performance

ACME THE TRUCK OF PROVED UNITS

Trade Mark Registered

Your Best Insurance

When you include in the standard specifications of your cars the Weston Ammeter you accomplish three very desirable things:

1. You give the car owner the Instrument which has behind it the Weston Prestige of over 30 years. Reliable service is assured.

2. You will meet a ready response and approval from the prospective purchaser of your car, for Weston Ammeters are advertised through magazine circulations reaching into the millions.

3. You will increase your own reputation and eliminate "come-backs" and complaints.

Weston Model 354 Ammeter

The Watch Dog of Your Battery



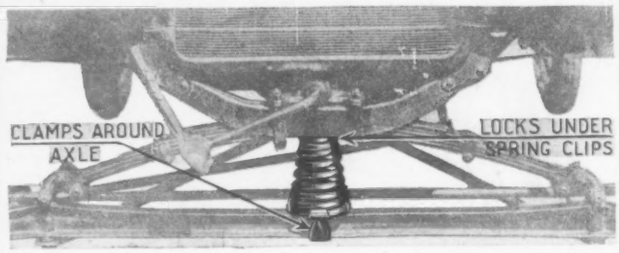
This is the Instrument with which the public is familiar. To its perfection we have devoted our best skill and experience, backed by the production facilities of our plant. Upon its performance in the hard grind of service under all conditions we stake our reputation for the manufacture of the finest and most efficient Instruments for every Electrical Measuring requirement.

We will meet you more than half way in the discussion of the Ammeter to be used on your cars. We will welcome any inquiry or investigation you may be pleased to make. May we hear from you?

Weston Electrical Instrument Co.

10 Weston Avenue **Newark, N. J.**

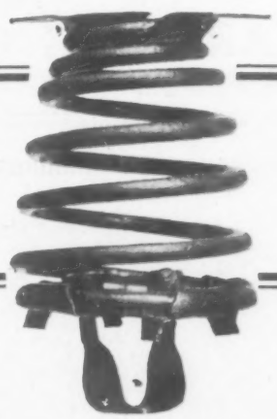
Our service organization is world-wide, covering the principal cities of this and other countries.



ARG AUXILIARY SPRING

Prevents—

Breaking Front Spring
Wearing Out Spring Hangers
Breaking Tie Bolt
Fender Irons Cutting Tires
Steering Arm Locking on Radius Rod
Radiator Leaks Caused by Heavy Jars



Installed in a Few Minutes

It clamps around the axle and locks under the spring clips. Sold under our iron clad guarantee: "They must make good or we will."

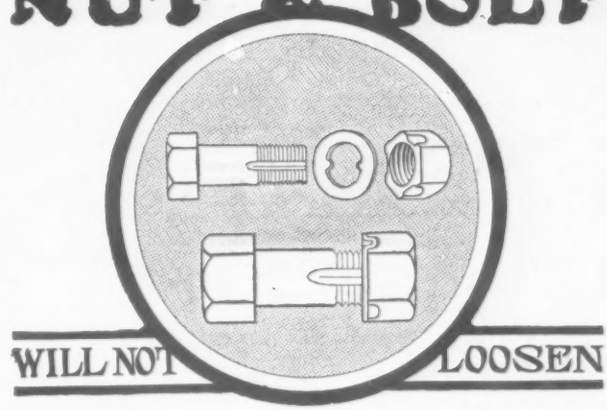
Dealers: Here is a device which you can recommend—a device which will interest every owner of a Ford passenger car, roadster or truck. ARG Auxiliary Springs are built in two sizes, light and heavy. In ordering specify whether for Ford touring car, roadster or truck. **Your jobber can supply you.** Price $5 each.

Jobbers: If you don't carry ARG Auxiliary Springs in stock, you are losing generous profits—because there is an established market for them. Order your supply at once.

Look for our exhibit at the Kansas City Auto Show

ARG Auxiliary Spring Co., Inc.
BIRMINGHAM ALABAMA

STEVENSON SAFETY INTERLOCKING NUT & BOLT



Reduces Bolt Breakage and Maintenance Cost

A large percentage of breakage of bolts in active use is occasioned by loosening. This permits a "throw," or shear, which causes the bolt to break.

The complete contact and permanent lock effected with the Stevenson device renders such loosening of the nut and bolt an impossibility, and therefore reduces thread wear and maintenance and replacement costs.

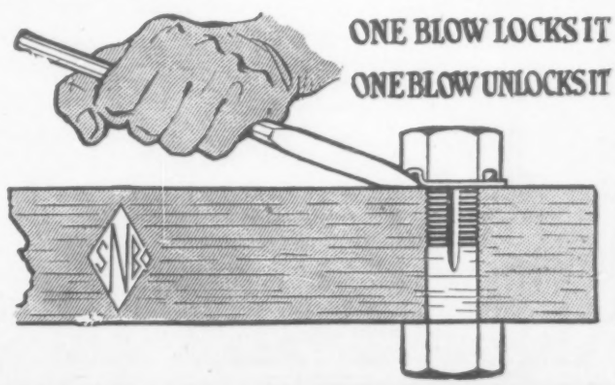
Depreciation, which results more from racking and breaking, due to loose bolts, than from natural wear, is greatly reduced through the use of the Stevenson Safety Nut and Bolt.

The slipping of a bolt, the loss of a nut, or the absence of a perfect safety nut lock on an automobile, locomotive or electric car largely increases the physical danger to passengers, the monetary loss in damages to the owners in case of avoidable accidents, and the cost and expense of operation through delays and lay-ups.

If you're interested in reducing bolt breakage and maintenance cost, write for sample, report of government tests, results of tests by railroads and descriptive literature; and learn more about this wonderful invention.

MANUFACTURED BY

THE SAFETY NUT & BOLT COMPANY
505 Union Building : : : Cleveland, Ohio



JON-CON SPELLS



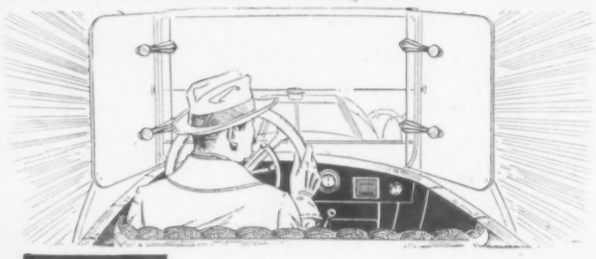
Genuine Tire Protection

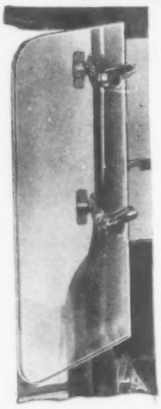
The Jon-Con Protector is made of one continuous piece of firm, elastic RUBBER and reinforced. It fits snugly between the outer casing and the inner tube; installed merely by pressing in with the fingers—no tools, no cement.

Jon-Con Protectors eliminate 95 per cent of punctures. Their thickness distributes road shocks to a larger area, thus preventing the majority of stone bruises and increasing tire mileage 50 to 100 per cent. The same Jon-Cons can be used in one tire after another.

Dealers:—Send to the address below for full particulars of Jon-Con Protectors. Sales representatives will be given full information regarding territory now open.

JONES-CONOVER PRODUCTS CO.
2124 N. 15th St. (Dept. A) Philadelphia, Pa.





STAR GLASS WINGS

We Have an

ATTRACTIVE

PROPOSITION FOR

DEALERS

If you are in a locality where you can get your glass cut and ground we will sell you the fittings and send patterns for glass. No holes in glass.

PRICE, Complete with Glass, $20.00 Pair

Reg. sizes of glass 8x18 in., 8x20 in., and 8x22 in.
Other lengths furnished as required.
Write for price of fittings

STAR WING CO.

170 W. Randolph St., CHICAGO

MAKE BIG MONEY

with

CROWN

Super

STORAGE BATTERIES

6-Volt Starting & Lighting $25
12-Volt Starting & Lighting $36

For Use on All Cars and Trucks

GUARANTEED FOR 18 MONTHS

A hard plate which gives long life—combined with an exceptionally high discharge

Your territory may be open. Write us today for full information and trade discounts. Prompt deliveries.

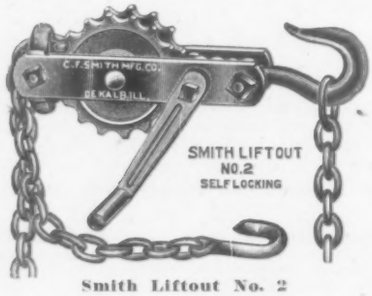
CROWN BATTERY CO.

15 Willis Ave., W., Detroit



Smith Liftout No. 1

The Smith Liftout No. 1 or No. 2 should be carried in every car or truck to draw you from mud holes and ditches. The No. 1 has drawn cars weighing 3,800 lb. up 15 foot embankments. Weighs 7 lb., has 8 ft. of draw chain and 4 ft. of Anchor Chain. Is self-locking, sells at $10.00 each.



Smith Liftout No. 2

No. 2 has 7 foot of draw chain, weighs 25 lb., is also self-locking. Sells at $20.00 each, also makes fine hoist for garage. Ask your dealer for it.

C. F. SMITH MFG. CO.

530 South First Street De Kalb, Illinois



Bingham Perfected Spark Plug and Intensifier

The "Bingham Perfected" Spark Plug is not only a spark plug, but a scientific intensifier as well, permitting motorists to know whether each or all plugs are functioning properly.

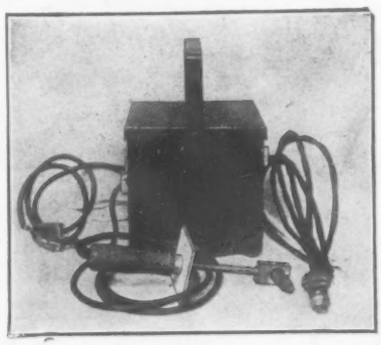
Constructed of the best material and by the best workmanship money can buy.

Dealers: The "Bingham Perfected" is a Spark Plug that every auto, tractor and gas engine owner should have. You can readily see the demand for such a scientifically constructed plug. Retail price $1.25. If your jobber can't supply you, write direct *at once* because Bingham territory is being rapidly taken by the wise dealers.

Bingham Perfected Spark Plugs

324 Mulberry St.,

ROCKFORD, ILLINOIS



ELECTRIC LEAD BURNING SET

used in place of the gas flame outfit

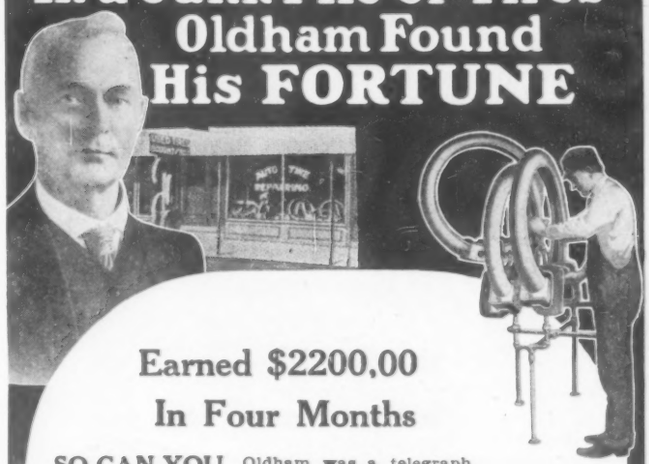
For Assembling Loose Plates and Straps and for burning on Connectors

A portable outfit, operated from any A. C. electric light socket. Complete at $40.00

SPENCE ELECTRIC COMPANY

136 Liberty Street New York City

In a Junk Pile of Tires Oldham Found His FORTUNE



Earned $2200.00 In Four Months

SO CAN YOU Oldham was a telegraph operator at a telegraph operators' pay and 53 years old when he found his fortune in a junk-pile of old, worn out tires. One day he read in an advertisement similar to this, of the money making opportunities in the Automobile Tire Repair business. He answered the ad and got Haywood's story—all the facts. He read what others had done—how hundreds of men are making upwards of $4000.00 a year making old tires new, repairing punctures, blow-outs, retreading the millions and millions of automobile tires. He determined to act. He wrote me for my proposition. I sent it. Then he bought a Haywood outfit and started in business in his old home town. In 4 months he made $2200.00, as much as he made in 2½ years as a telegraph operator.

HAYWOOD'S TIRE SURGERY

GIVES NEW LIFE TO OLD TIRES

YOU CAN MAKE $2500 TO $5000 A YEAR

Think! You men who are seeking a permanent, big paying business of your own. The possibilities in the same field that is making OLDHAM a fortune. It is a field practically new. Uncountable millions of automobile tires are thrown in the junk-pile; tires that can quickly and profitably be remade by Haywood's Tire Surgery and Haywood Equipment—tires that can be put back into service and run 4000 to 5000 more miles. You can do it equally well or possibly better—Oldham's record of money making—it's being done every day; it's facts within reach of every ambitious, determined man. If you are that calibre you will sit down now and write Haywood for full particulars. When you get all the information you want, you will jump at the opportunity. You will see an opportunity bigger by far than we can hope to tell in the limited space of this magazine.

NO EXPERIENCE NECESSARY—I'LL TEACH YOU

No previous training, no apprenticeship, is required to enter this business—not even the faintest knowledge of tires. If you have a little mechanical turn of mind, you can quickly become an expert. We teach everything. You learn in a week to handle all kinds tire repair jobs—make old tires new. You'll know how to repair every kind of cut, gash, bruise, that can happen to any tire. You become a Tire Surgeon, that's what you'll be, and the chance to make money is something wonderful.

Free Book Gives All Facts—Write Me Today—Mail Coupon

I have ready to mail you the day I get your request, a fascinating book—all about tires—how to repair them by the Haywood Method—how to start in business—how to build up trade—what to charge. You needn't write a letter—just tear out the coupon right now, fill it in and mail. In 48 to 72 hours you can have the whole proposition right in front of you. It's a case of walking right into $2500 to $4000 a year and up. Use coupon, or send a post card.

HAYWOOD TIRE & EQUIPMENT CO.

M. HAYWOOD, President

720 Capitol Avenue

INDIANAPOLIS, IND.



M. Haywood Founder Haywood System of Tire Surgery.

EARNS $800 MONTH



E. T. Buchmann is a Tire Surgeon at Chicago. He says: "Am earning $800 per month, and confining myself solely to re-building of Tires by Haywood Method."

J. W. Blair, Toledo, O., says: "When I started 3 years ago, I had $50 left after paying for my outfit. Now have $1,000 in the bank.

Clip and Mail TODAY

M. HAYWOOD, President

HAYWOOD TIRE & EQUIPMENT CO.

720 Capitol Avenue, Indianapolis, Ind.

Dear Sir: Please send me by return mail your free book on the new Haywood Tire Surgery Method and the details of your free school of tire repairing.

NAME .....

ADDRESS .....

Your Name In Your Customers' Hands

This Pet Cock Opener daily in the hands of your Ford customers with your business address on the handle, is a business getter for you.

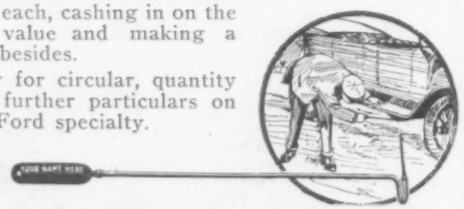
UNIVERSAL
PET COCK OPENER
FOR FORDS

Some are giving Universal Pet Cock Openers away, because they cost so little and the advertising is so profitable—

Others are selling them at cost—

And there are some who retail them at 25c each, cashing in on the advertising value and making a good profit besides.

Write today for circular, quantity prices, and further particulars on this handy Ford specialty.



AUTO METAL PARTS COMPANY

Dept. of Sales
624 Michigan Ave., Chicago, Ill.

Factory: Des Moines, Iowa

Strong, durable Cleaning Needle long enough to go all the way through the pet cock.



PATCH Manufacturers

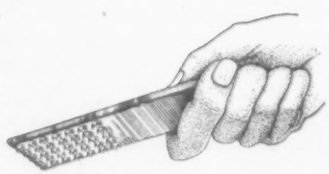
Make Your Inner Tube Patches Permanent With

"Cordell Buffer"

Patches are bound to hold when the tube is first thoroughly cleaned and rasped with a Cordell Buffer. When patches fail to hold nine times out of ten it is because the patch was placed on a hard, oily tube surface.

Send for a stock of Cordell or Nugent Buffers today. Enclose a buffer in each package of patches you sell. Then motorists will find that **your patches will stick.** The result to you will be increased business and better profits. And the cost will be small.

Prices: Cordell Buffer (shown above), $7.50 per thousand; Nugent Buffer (shown below), $5.00 per thousand.

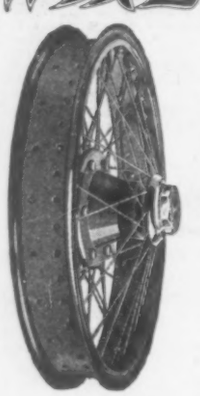


CORDELL MFG. CO.

709 Pine Street, St. Louis, Mo.

WIRE WHEELS

HOUK



We can supply immediately, sets of Houk Wire Wheels for all the cars listed and any of the service stations below will gladly install them.

Dealers should send at once for the particulars of our service and sales agency proposition.

Buick	*Haynes*	*Overland*
Cadillac	*Hudson*	*Paige*
Chalmers	*Hupp*	*Scripps-Booth*
Chandler	*Kissel*	*Studebaker*
Chevrolet	*Lexington*	*Stutz*
Cole	*Marmon*	*Velie*
Dodge	*Maxwell*	*Westcott*
Dort	*Moon*	*Winton*
Essex	*Nash*	
Franklin	*Oldsmobile*	

HOUSE



List price for set of 5 House Wire Wheels, 4 inner hubs, 4 hub caps, hub cap wrench, spoke nipple wrench, one hub dust cover for spare wheel. White, Black, Red; colors optional.

For FORDS, **$70;** for Chevrolet 490 and Overland Model 4, **$80.**

WIRE WHEEL CORPORATION OF AMERICA
(Successors to Houk Manufacturing Co.)
1700 Elmwood Ave. Buffalo, N. Y.

Direct Factory Branches and Service Stations:

New York, 835 11th Ave. at 57th St.
Philadelphia, 328 N. Broad St.
Chicago, 23rd St. and Indiana Ave.
Detroit, 11 Leland St.
Los Angeles, 1216 S. Grand Ave.
San Francisco, 1690 Pine St.

Exclusive Canadian Representatives:
Dunlop Tire & Rubber Goods Co., Toronto

Necessary In Every Shop



No. 20 tip shown attached — general purpose tip.

No. 40 tip—radiator and special work.

No. 30 tip—for special and intricate work.

Three Tools in One For Your Shop

Soldering iron, brazing torch and light all in one tool. You need it in your shop. Just HOOK UP the Sod-Tor-Lite to a Presto Lite or Searchlight tank and have a hot point in a minute. The flame is inside—the tinning will last longer. Torch heat over 3650 degrees Fahrenheit if you want it. Built of finest materials. Very compact, durable and strong. Hose union fits three popular size tanks. Six foot hose with equipment.

Saves time and trouble—costs less than the three tools it replaces—no generating—less work in using it.

SOD-TOR-LITE

"SOD" for Soldering Iron—"TOR" for Torch—"LITE" for Light

Write for prices and full information. Then if you want this wonderful tool we'll send it C. O. D. Use it for ten days and if you are not thoroughly satisfied, return the tool at our expense and your money will be refunded, or upon recommendation from your banker we will send it direct to you on open account. Use it for ten days and remit us if satisfactory.

Note: We also make SOD-TOR-LITE Set No. 6, which adds to the above equipment a lead burning and welding attachment.

Dept. B

B. E. HICKEN SOD-TOR-LITE CO.

Prairie Hill, Missouri



A SMOKING MOTOR IS WASTING OIL AND GAS

accumulating carbon—fouling spark plugs and piling up present and future trouble and expense for the owner.



Pat. Mar. 2, 1915, Feb. 29, 1916

PRESSURE-PROOF RINGS WILL STOP THIS

The Expander forces an even, constant pressure against one side of the groove and outward against the cylinder wall.

All wear, even the slightest, is thus automatically taken up, and groove clearance through which oil may be sucked into the cylinder above the piston ring (where it would ignite and form carbon or pass out as smoke through the exhaust) becomes impossible.

Pressure Proof Rings insure permanent, full power and greatest operating economy.

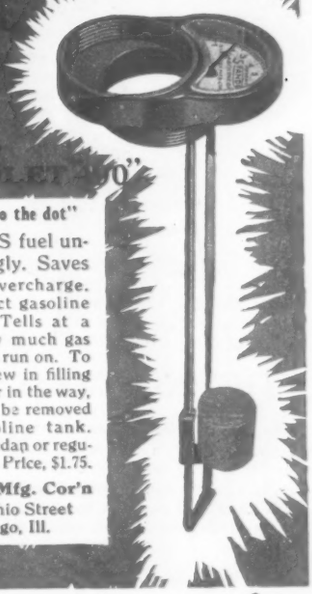
One Pressure Proof three-part or **two Pressure Proof Jr. two-part rings** make a full piston equipment. Less in first cost than an equipment of any other special rings.

PRESSURE PROOF PISTON RING CO.
107 Massachusetts Avenue Boston, Mass.
Pressure Proof Rings, Ltd., Sherbrooke, Que.

POWER · ECONOMY · ENDURANCE

STANDEX

GASOLINE GAUGE for FORD CAR or CHEVROLET 4-90"



"Accurate to the dot"

METERS fuel unerringly. Saves gasoline overcharge. Shows exact gasoline mileage. Tells at a glance how much gas you have to run on. To install, screw in filling hole. Never in the way, never need be removed from gasoline tank. Made for sedan or regular model. Price, $1.75.

Standex Mfg. Cor'n
341 E. Ohio Street
Chicago, Ill.

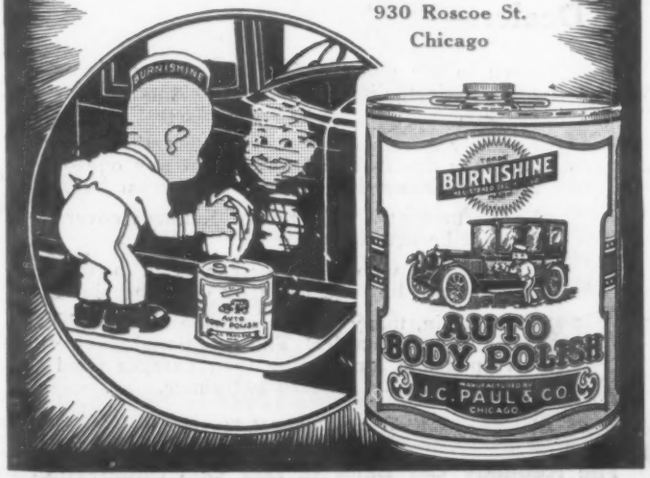
BURNISHINE

Auto Body Polish

The automobile body polish without a rival. Imparts a gloss and lustre that beautifies and protects your car. Easily applied and low in cost.

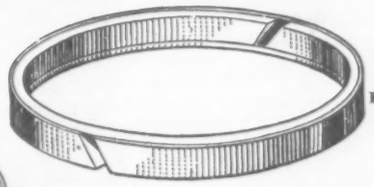
In quarts, half-gallons and gallons. Ask your dealer for Burnishine.

J. C. PAUL & COMPANY
Manufacturers
930 Roscoe St.
Chicago

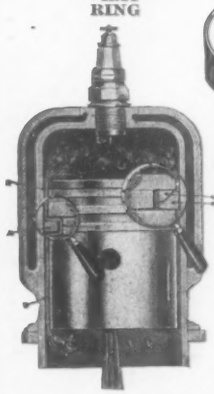


Carbon-O Piston Rings

THE VALVE SEAT RING



PATENT PENDING



Hold Compression

And prevent oil pumping in a worn ring groove. Oil cannot leak behind it because it fills the groove. In the illustration "A" shows how compression leaks past a ring that does not fill the groove.

"C" illustrates how the inside half of a Carbon-O Valve Seat Ring—cut on a bevel—acts as a wedge that holds the outside half against the cylinder wall, absolutely preventing oil pumping or loss of compression.

DEALERS:—Those selling the Carbon-O Ring report a greater volume of piston ring business than ever before. Write at once for our proposition. It will be profitable for you.

STEAM TRACTOR AUTO & MFG. CO.
219 W. Seventh St. Sioux City, Ia.



THE ONAN TESTING DEVICE

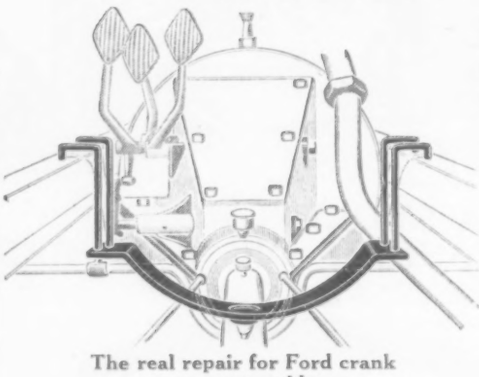
This sturdy and simple device is guaranteed to test and drive every known model of electrical units. It will avoid many delays by making absolutely sure magnetos, generators, and other units function properly within themselves before they are re-installed on model. Priced from $55 to $80. Send for illustrated information—NOW.

DAVID W. ONAN, Minneapolis, Minnesota

1320 Penn Ave. North

Jobbers, write for Onan Testing Device proposition.

The VICTORY MOTOR SUPPORT for FORDS



The real repair for Ford crank case arm troubles

is a hammock shaped pressed steel plate fitting close under the Ford motor and attached to main chassis frame by the means of four hook bolts.

The Victory is the only repair for crank case arms applied without removing bolts or other original parts. Do not even remove the broken parts but draw them together and make a permanent repair that leaves the motor more rigid than originally. Any one can install in ten minutes. Monkey wrench only tool required.

As a preventative the Victory should be on every Ford. Not only is this a repair but if installed on any Ford will prevent breaking of crank case arms, and by relieving the constant strain and vibration on these arm fastenings will prevent oil leaks in the crank case.

You should have a few of these in stock. Ask your supply house, or write us for further information, giving us the name of your jobber.

SIMONSEN IRON WORKS

SIOUX RAPIDS, IOWA

20th Century Cold Patches —Stick till the tube wears out.

There's a reason why motorists favor 20th Century Cold Patches. They do the work with the least trouble. No messy methods, no heat, no tools required. Stick 'em on in two minutes, and they STAY STUCK.

The first mile traveled makes "20th Century" Cold Patches a part of the tube itself; to last the entire life of the tube.

Made in two styles, Rubber Back and Fabric Back

Regular Sizes in Handy Tubes

Fabric Back—
2½x16 50c; 4x15 75c
6½x20 $1.50

Rubber Back—
2½x16 50c; 4x20 $1.00

We also manufacture a full line of blow-out Patches—leaders in their field. Absolutely Guaranteed — The user is the judge.

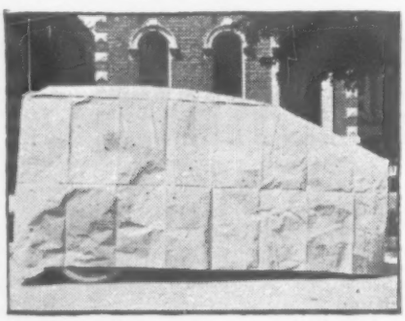
DEALERS—Order a full supply of 20th Century Patches from your Jobber. If he cannot supply you, write us direct.





20th Century Tire Protector Co.

MIDLOTHIAN, TEXAS



Kennedy Auto Covers

PROTECT

against Dust, Dirt Rust, Cold & Moisture

Dealers—

Even in the most modern garages, public or private, dust, dirt, rust, and moisture, gather on cars.

Kennedy covers completely protect the car—and they are so standardized that any one of the three Kennedy sizes will fit any car built.

For permanent winter storage, Kennedy covers can not be equalled.

Car owners who keep their cars in private garages will buy the Kennedy cover on sight.

Then again, many dealers provide a Kennedy cover to each boarder. This additional service is responsible for keeping their garages filled to capacity with satisfied patronage.

Write for illustrated literature

The Kennedy Car Liner & Bag Co., Shelbyville, Ind.

LUTHY

NON-BREAKABLE CELLULOID HYDROMETER



5 POINTS OF SUPERIORITY

1. Non-Breakable — throw the Luthy into the tool box—always ready and undamaged when you need it.

2. Exceptionally Accurate — graduations on celluloid superior to those on glass.

3. Impervious to acid—celluloid not affected by battery acids.

4. Long Life—nothing to wear out and withstands extraordinary usage without breaking.

5. Easy to read—graduations on celluloid stand out distinctly, assuring speed and accuracy of testing.

Dealers:—Write your nearest jobber for samples of our celluloid hydrometer and battery filler. Two good items—and good merchandise is the cheapest in the end.

Jobbers:—List these fast selling items. Electros furnished.

LUTHY HYDROMETER CO.
97 Woodward Ave. Detroit, Mich.

BUCKEYE TOURING CAR TOW CABLE PUT ON A REEL



This is the only Towing Cable put on a reel and made with a Double Malleable Hook. You will not kink this cable nor break the hook. We also make one for trucks.



Cable and chain tire locks for locking spare tires

Write for descriptive circular



THE BELLEVUE MANUFACTURING CO.
BELLEVUE, OHIO

OLD SOL SPOTLIGHTS



"OLD SOL"

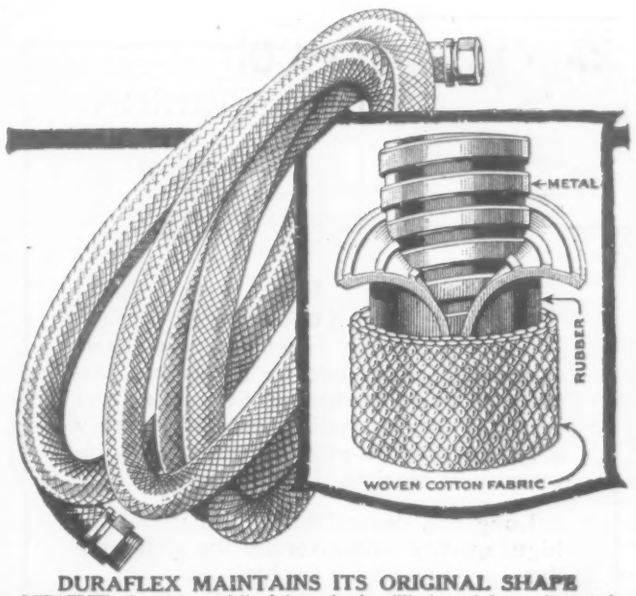
No. 76 Liberty Searchlight. Price $5.50

Combined Push Button switch and focusing control in handle. Wing nut on bracket for inspection lamp. Double clamp bracket. Duplex wire to battery.

Three-inch mirror integral with lamp body, extra large silver plated reflector. Special high candle power bulb. Black enamel finish only.

Diameter of lamp front, 7 in. Weight, packed in 9½x6¾x6¾ carton, 4 lbs.

Made and Distributed by
THE HAWTHORNE COMPANY
Grassmere Avenue Bridgeport, Conn.



DURAFLEX MAINTAINS ITS ORIGINAL SHAPE

DURAFLEX, the new metal-lined hose, bends willingly and is so pliant and flexible that it can be used in any awkward position and returns to its original shape.

The smooth bore, semi-interlocked metal tubing keeps out all dirt, dust or particles that tend to clog up valves. DURAFLEX is asbestos-packed, evaporation-proof, will not get leaky, kink or blister.

Over the metal tubing of DURAFLEX a rubber hose is vulcanized, then a balance-woven cotton jacket is spun over the rubber which insures uniformity in construction and stress.

The three layers of metal, rubber and fabric make DURAFLEX air-tight and leak-proof. Write us today about your hose problem.

HERBERT J. MEYER CO.,
183 Cedar St., Buffalo, N. Y.

DURAFLEX
GASOLINE HOSE



A Radiator Hose with a Guarantee



Just ordinary radiator hose will not satisfy car owners today—that's why we built a quality hose and placed the A-B-C trade-mark on it.

We secured heavy quality duck—used tested compounds for the cover and friction and made a substantial, serviceable grade of hose—second in quality to none. A-B-C hose will withstand oil, heat and water, also anti-freezing solutions.

And after years of successful selling of this product we find that our absolute guarantee, "it will make good or we will," has been one of the best helps our dealers have in moving their stock of A-B-C hose.

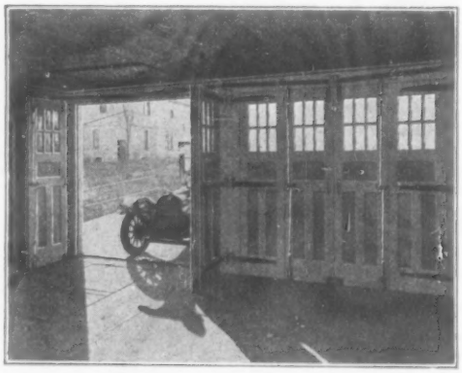
Write to us about this hose—also A-B-C Brake Lining—A-B-C Fabric Fan Belts and A-B-C Sheet Packing.

American Brake Lining Co.
Lansdale, Pa.

A-B-C BRAKE LINING

Slidetite

THE LAST WORD IN GARAGE DOOR HARDWARE



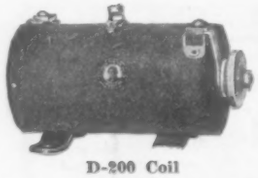
Gives more of service to the garage user than any other style of garage hardware made. Acknowledged by Owners, Builders, Architects and Hardware Merchants to embody the greatest amount of convenience, economy and ornamental possibilities.

Simple to install, easy to operate, readily adjustable.

Doors can't sag. Stand where you open them without locks or holders. Close, weather-tight. Add to the appearance of the building.

Write for descriptive folder FF1

Richards-Wilcox Mfg. Co.
"A Hanger for any Door that Slides"
CHICAGO ST. LOUIS LOS ANGELES PHILADELPHIA — AURORA, ILLINOIS, U.S.A. — BOSTON NEW YORK MINNEAPOLIS SAN FRANCISCO — LONDON, ONT.



D-200 Coil

JEFFERSON Ignition Coils

There is a Jefferson Coil for every purpose. Jefferson is the only complete line of interchangeable ignition coils on the market. Because of their interchangeability, dealers can supply a wide and varied demand from only a small stock. A proportionately small investment is required.

Long life, dependability and uniformly high quality characterize the Jefferson line.

Send for coil list giving all cars that are coil equipped and the types of Jefferson Coils and Brackets to be used as replacements.



R-300 Coil

Jefferson Electric Mfg. Co.
432 S. Green St. Chicago, Ill.

WORKRITE HYDROMETERS

Are recognized by the trade as the last word in Hydrometers. We now offer our new

NO. 3 OUTFIT (Shown at Right)



This is especially designed for fast and accurate work in Garages and Battery Service Stations. "GRAB IT OUT AND DROP IT IN." The gallon jar has a soft rubber lined mouth, which prevents breakage. Convenient for distilled water or electrolyte. With our special tapered barrel, we GUARANTEE THAT YOU CANNOT MAKE THE TOP OF FLOAT STICK TO SIDE OF BARREL.



The time saved will pay for this Outfit in a few days. LIST PRICE, $2.50.

WORKRITE HYDROMETER

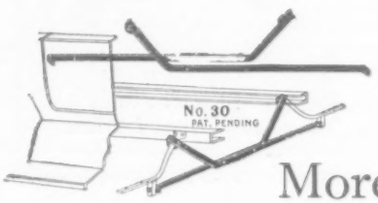
Rubber collars at each end prevent breakage if dropped. Square collar prevents rolling. High-grade bulb insures long life. Float guaranteed accurate. LIST PRICE $1.

ON YOUR NEXT ORDER see that your jobber supplies the genuine WORKRITE. Write for description of different models.

THE WORKRITE MFG. CO.
5607 Euclid Avenue CLEVELAND, OHIO

BROCKSMITH
2in1 Running Board Supports

—offer unusual profit-making opportunities for dealers because they have a big demand among particular motorists.



More Safety

More Profits

The Brocksmith 2 in 1 Running Board Support consists of a brace for the front and one for the rear. The detail at the top of illustration is to show how each support is constructed.

Dealers: Order **now** through your jobber. The demand is already established.

Jobbers: Get in touch with us at once.

BROCKSMITH MFG. CO.

ST. LOUIS MISSOURI

"WHITNEY" KEYS

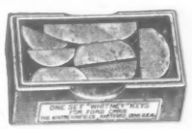
For the benefit of dealers and repair men we put up our keys in two assortments. Every garage man and repair man should keep these on hand. They may be purchased from the leading jobbers or ordered direct from the factory.

Regular Assortment



One hundred keys of the sizes most likely to be required for repair work on Motor Cars, Motor Trucks and Tractors.

Ford Assortment



One set of keys for the Ford car. These keys are of the special material and special treatment specified by the Ford Motor Company.

The Whitney Mfg. Co.

HARTFORD, CONNECTICUT

CHAINS, KEYS AND CUTTERS, HAND MILLING MACHINES

BRUHNS DOUBLE EXCENTRIC JACK

Bruhns Double Excentric Adjustable Jack in your shop means many dollars added profit in time and labor saved. It is strong, durable and safe in operation —it has a fool-proof lock.

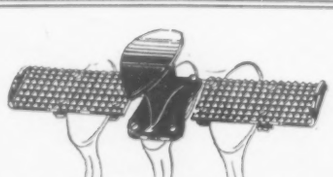
By the use of our double excentric, the jack lifts twice with one pull of the lever —you can lift either end of a car clear from the floor regardless of oversize tires.

We guarantee the Bruhns Double Excentric Adjustable Jack to give absolute satisfaction or money will be refunded.



BRUHNS MANUFACTURING COMPANY

Dept. 7, Hammond, Ind.



Put Common Sense Pedals on Your Ford

Practically every Ford owner has had trouble with his pedals. Common Sense Pedals mean sure control of your car, greater security against accidents and less strain on the driver. Note how the central (reverse) pedal is elevated above the others, making it as easily accessible as the others.

Dealers can put a set of Common Sense Pedals on every Ford car whose owner has any interest in better equipment. Their installation is easy. No holes have to be bored. They clamp on securely and are on to stay.

Write us today about them.

Jobbers, Write for Proposition

DICKSON AUTO PARTS COMPANY

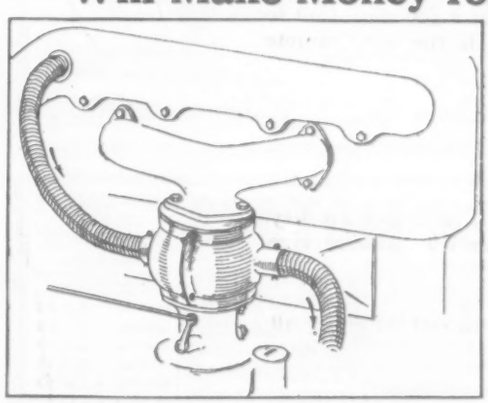
2 Columbus Circle, New York City

The Losee

Protect-O-Motor

"HOT SPOT"

Will Make Money for You



Winter slumps in the business — and profits—of progressive automotive dealers are now things of the past. They stock up with winter accessories. And the accessory that is helping many dealers to boost their winter profits is the Losee Protect - O - Motor (Hot Spot). It will make money for you too.

Operated by Waste Gases

By salvaging waste gases from the exhaust pipe, it keeps motors hot, insuring a quick start and smooth running. Easily fitted on between the carburetor flange and the intake manifold.

Write for dealers' Proposition.

MADE BY

J. S. LOSEE HEBRON, ILL.

DAYTON WIRE WHEELS

SERVICE STATION EQUIPMENT

Equipment and Supplies
for the
MOTOR CAR—TRUCK—TRACTOR
MOTOR-BOAT — AEROPLANE

Machine Shop—Garage—Vulcanizing Plant
OUTFITTERS

BECK & CORBITT

AUTOMOTIVE EQUIPMENT
First Street—Ashley to O'Fallon ST. LOUIS, MO.

FIRESTONE DEMOUNTABLE RIMS

AMBU BATTERY PRODUCTS

Steel Tires & Mud Chains



Old Tires Covered Complete

Try 2 or 3 sections over any old blowout. Can't have blowouts, punctures; neither can the rubber wear off.

Special prices to those in new territory

Mud chains can be put on in a jiffy with one hand while standing on the running board. Hook the ends together and push the little lever. If you get in a mud hole you will laugh out loud.

Kimball Tire Case Co., 173 Broadway **Council Bluffs, Ia.**

MERCER MOTOR CARS

THE Mercer shield is the badge of fastidious taste in automobile. Mercer means the utmost in substantial smartness, riding comfort, and power. The possessor of a Mercer invariably feels a bit better satisfied than the owner of another car. Correspondence from dealers invited.

Mercer Automobile Company, Trenton, N.J.
800 Whitehead Road

MOTION PICTURES

Developed—Printed

The American Film Company, Inc., one of the foremost manufacturers of motion pictures in the world, is now prepared to develop and print industrial film subjects for YOU. Its prices are reasonable. It will return positive prints to you within a surprisingly short time. From a technical standpoint it is without a rival. The highest grade of developing, printing, tinting, toning, and titling is guaranteed. Write for further information.

AMERICAN FILM COMPANY, INC.
6227 Broadway Dept. A Chicago, Ill.

Sell Skid Chains—Now Is the Season

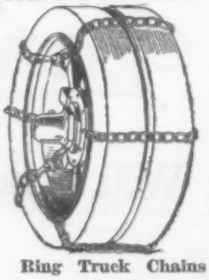
During the five years they have been made No-Stuck Chains for passenger cars and Ring Truck Chains have proven themselves absolutely reliable. We believe them to be the best chains to take a car through mud, sand, snow and bad roads.

Our generous dealer proposition is worthy of your interest. Wire or write us. We'll tell you how to boost your winter profits.

Write for descriptive literature.



No-Stuck



Ring Truck Chains

Kalamazoo Chain Co., Kalamazoo, Mich.

AMBU

TESTING OUTFITS

CADMIUM TESTING

The one easy way to test the separate sets of plates in a battery without taking it down is by the cadmium process. To make this simple use the AMBU Cadmium Test Outfit. Specially calibrated positive and negative voltmeter; with flexible leads mounted with cadmium electrode.

Complete $25.00
Voltmeter only 22.50
Leads only 3.25
When ordering specify—Voltmeter with leads or leads only.

ARMATURE TESTER

A handy portable outfit—for testing any armature of generator or motor that has a commutator. Locates and diagnoses, grounds, crossed connections, shorts, open circuits, etc. No delicate parts to get out of order. Any mechanic can, with a little practice, test an armature in a few minutes. Unequalled for motor generator testing.

Complete $30.00

Your jobber can supply you. If not write to the

AMERICAN BUREAU of ENGINEERING, 1605 Mich. Ave., CHICAGO
Makers of the Famous AMBU Electric Trouble Shooter

NEW MOTORS FACTORY GUARANTEED ALL SIZES IN ORIGINAL BOXES



Battery Charging Outfits

Polyphase Motors
2 and 3 phase, A. C. 220 volts, 60 cycle, 1730 R.P.M., complete with base and pulley.
½ H.P. - - $42.50
1 H.P. - - $59.50
2 H.P. - - $72.50
3 H.P. - - $84.50
5 H.P. - $102.50
1 H. P., high speed, 3600 R.P.M., 220 volts, 3 phase only - $36.50

Single Phase Motors
110-220 volts, A. C., 60 cycle, 1800 R. P. M. with pulley
¼ H. P., 110 volts, induction, full load start - - $24.50
½ H. P., 110-220 volts, induction, full load start - $38.50
½ H. P., 110-220 volts, repulsion, for compressor $46.50
1 H. P., 110-220 volts, repulsion, with sliding base - - $67.50
2 H. P., 110-220 volts, repulsion, sliding base $108.50
3 H. P., 110-220 volts, repulsion, sliding base $124.50
5 H. P., 110-220 volts, repulsion, sliding base $164.50

Charging Generators
Suitable for all lighting, Battery Charging and Power Requirements.
6 volts, 10 amp. - $16.50
15 volts, 10 amp. - $21.00
40 volts, 6 amp. - $24.50
110 v, 2½ amp. - $24.50
40 volts, 12 amp. - $38.50
110 volts, 5 amp. - $38.50
40 volts, 25 amp. - $58.50
110 volts, 12 amp. - $58.50
Moving Picture Arc Generator 60 v., 35 amp. $85.00

WRITE FOR CATALOG. BARGAINS IN MOTORS AND GENERATORS

1/4 H.P. SPECIAL 110 volts, 1725 R.P.M. A.C. or D.C. Complete, cord, plug & pulley $19.75 Each

WASHING MACHINE MOTORS Suitable for operating Small Compressors, Coffee Grinders, Buffing Machine, Washer's Elec. Reg. Val. $35.00

MONEY BACK GUARANTEE

SHIPPING TERMS: 25% deposit required on all orders. Balance C. O. D. by Express. Tight draft with Bill of Lading attached for freight.

MANUFACTURERS' DISTRIBUTER

CHAS. H. JOHNSTON, Box 28, West End, Pittsburgh, Pa.



You Save Time With the ATSCO

Here is the greatest time saver for filling tires. The ATSCO Portable Air Tank for road repairs is genuine copper-brazed. It is the tightest, safest, strongest tank constructed. The large convenient grip makes it easy to handle. Comes complete ready for use with eight feet of hose. $24.50 f. o. b. Pittsburgh. Send for one today. Manufactured only by

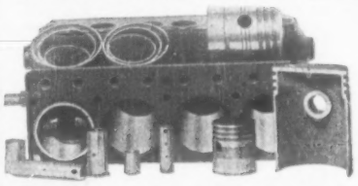
AIR-TIGHT STEEL TANK CO. Main Office and Works: Pittsburgh, Pa.
Producers of gasoline storage tanks and pressure tanks for all purposes.

We Increase the Life of Motor Cars

More power and less gasoline—more service and less trouble—that is what our modern method of rejuvenating old, worn out motors will do for any car. We double the life of your customers' cars.

CYLINDER GRINDING

The work of regrinding is economical when compared to the price of new cylinders and pistons.
We are expert cylinder grinders and guarantee every piece of work turned out at our factory. Special price on Fords—Grinding cylinders and fitting pistons only, $10.00.



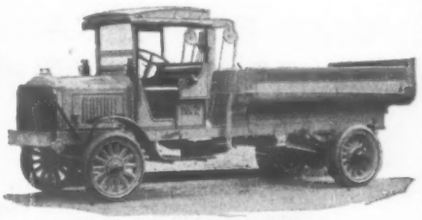
Wire or write for details

ST. PAUL AUTO CYLINDER GRINDING CO.
1152 Rice St., St. Paul, Minnesota

Standard

MOTOR TRUCKS

1, 2½, 3½, 5 Ton



"All the name implies"

WHILE Motor Trucks have Come and Motor Trucks have Gone—the Standard Motor Truck Company has steadily led for ten years in the building of Quality Trucks—which are most profitable in the end for men who own them and men who sell them. STANDARD Owners and STANDARD Dealers are numbered among the trucking enthusiasts of the world.

Dealers, Write for Territory.

Standard Motor Truck Co., *Detroit, Mich.*

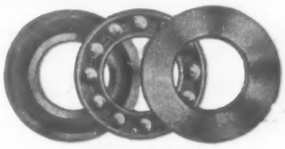
SAVAGE

REAR AXLE

SAVAGE QUALITY TRADE MARK

SAVAGE ARMS CORPORATION
SELKIRK, N.Y.

UTICA NEW YORK DETROIT PHILADELPHIA



We Do Not Stock or List

BALL THRUST BEARINGS

but build them to the requirements of the user

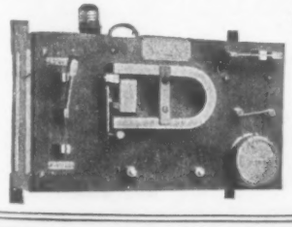
Let us quote on your bearing requirements and duplications of the Thrust Bearings you are now using.

The Bearings Company of America, Lancaster, Pa.
Western Sales Office—1012 Ford Bldg. Detroit, Mich.

FORE RECTIFIER TYPE 2-B

Will Charge Both 6 and 12-volt Batteries at Cost of 5 to 15 Cents

Will charge two 6-volt batteries at 6 ampere charging rate at one time. Is self-starting and upon resumption of line current the charging is continued. Entirely safe to put battery on charge during the night. Battery cannot be harmed by leaving it on over charge. The current consumed is very small. There is no maintenance expense or depreciation so that the cost per charge is simply for the current put into the battery.



Send for prices and illustrated literature

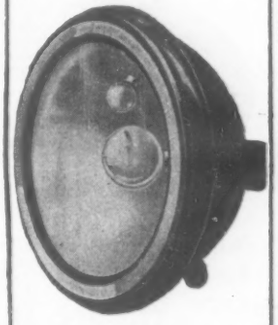
Kentucky Electrical Co.
Incorporated
Owensboro, Kentucky

Use Headlights That Identify Your Car

New and distinctive types of electric headlights for all cars.

Lights that identify Your car. Built by the largest manufacturer of automobile lamps.

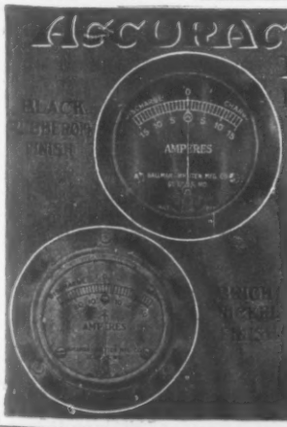
The John W. Brown Mfg. Co.
Columbus, Ohio
Detroit Offices: 411 Union Trust Bldg.



ACCURACY-BEAUTY

B-W THE NEW B-W

DIRECT CURRENT AMMETERS



Real Style, Coupled With Absolute Accuracy is the B-W mark of superiority. Purchase an Ammeter that will harmonize with the interior finish of the car. The B-W Ammeter is built to look well. Don't install inferior instrument that will detract from car's appearance.

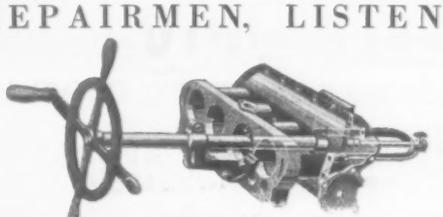
In the B-W you have an instrument carefully designed, skilfully made, to give perfect service. The B-W unfailing accuracy makes the Direct Current Ammeter absolutely reliable.

The handsome new open face and its indicator are easily readable and eliminate chances of mistake. Here you have distinction and reliability—THE BEST. It costs but little more.

WRITE FOR LITERATURE.

BALLMAN-WHITTEN MFG. CO.
4060 Forest Park Blvd., St. Louis, Mo.

REPAIRMEN, LISTEN!



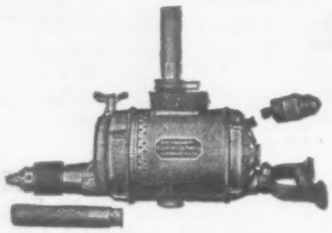
Patented
May 19, 1914; June 20, 1916; Dec. 15, 1914; June 26, 1917.

THE HEISER CYLINDER REBORING MACHINE for Ford motors centers itself from both ends of the cylinder. Rebores between centers positively eliminating taper bores. It is adjustable and the only machine on the market that will fit different size pistons without a micrometer measurement. The cutters are sharpened on the cylinder wall, which means that it is the only machine on the market that does not have to be returned to the factory to be reground. The best mechanic in the world can't build a reputation without proper TOOLS and EQUIPMENT. The HEISER CYLINDER REBORING MACHINE makes good shops out of poor ones and better shops out of good ones. For sale by all leading Jobbers. Write today for full particulars.

HEISER SPECIAL TOOL CO., 168 Rogers Building, Kingston, Mo.

BEST FOR GARAGE WORK

"Cincinnati" Portable Electric Drills are made in all sizes for any current.



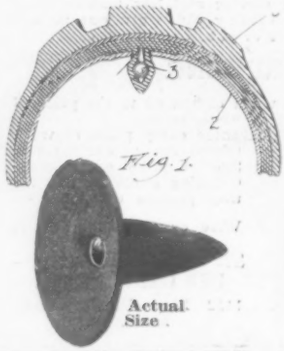
Also, Bench, Floor and Tool Post Grinders

Write for Garage Catalogue

The Cincinnati Electrical Tool Co.
CINCINNATI, OHIO

NO-C-MENT PUNCTURE PLUG

SELLS ON SIGHT



No cement needed—no time wasted. The motorist simply puts in the plug, inserts the ball bearing—and the hole is patched—to stay. Impossible to slide or creep. The nipple goes inside the tube, the ball bearing goes down inside the nipple, then the air in the tube forces the patch against the tube and seals it air tight.

Dealers: Big profits are yours on the NO-C-MENT Puncture Plug. Every motorist will appreciate at once the advantages of the NO-C-MENT method over the old time-wasting cement way.

Sold through regular jobber and dealer channels. If your jobber does not carry NO-C-MENT in stock write direct to us and send his name. Box of 10 for $1.00.

H & K ACCESSORY CO.,
4005 W. North Ave., Chicago

SEALS JOINTS TIGHT

We'll Send You a Generous Piece of Likehyd

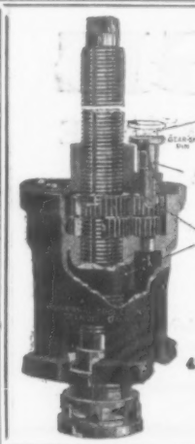
A piece 3 square yards, 1/32 in. thick for the special price of $2.00. Try this tough, everlasting gasket material. It is water, grease, oil and gasoline-proof—will not ooze or blow out.

Territory open for salesmen, dealers and distributors—generous proposition.

BURGIN & CO., Inc.
487 Broadway New York

Likehyd
The fibre sheet packing





THE Universal Cylinder Reboring Tool has been tested out and adopted as standard equipment by the manufacturers of this country's finest motor cars.

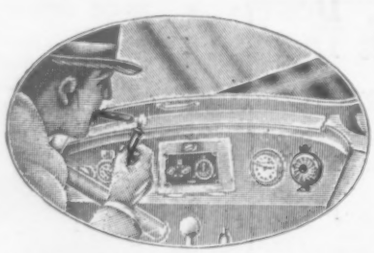
These men have put the Universal Reboring Tool through every severe test that their engineers could devise—and the tool made good consistently.

You need it in your business.

See current issue Automobile Trade Directory and Chilton's Automobile Directory for list of jobbers carrying stock.

Write for Catalog

The Universal Tool Co., Inc.
435 Woodward Ave. Detroit, U. S. A.
Manufacturers of Universal Cylinder Reboring Tools for all automobile motors and Main Bearing Replacement Equipment for Ford and Fordsons.



The Auto-Spark-Lite

A practical, easily attached cigar lighter for the autoist. Retails at $5.00, with attractive discount to dealers.

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Fill Grease Cups Now—For the Winter With

NON-FLUID OIL

won't harden with cold or non use—makes winter lubrication as satisfactory as summer.

Use K-OO Special Grade for gears
K-OOO for all Bearings

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1½, 2, 3½ and 5 Ton WORM DRIVE Models
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SELDEN TRUCK CORPORATION
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Selden Motor Trucks

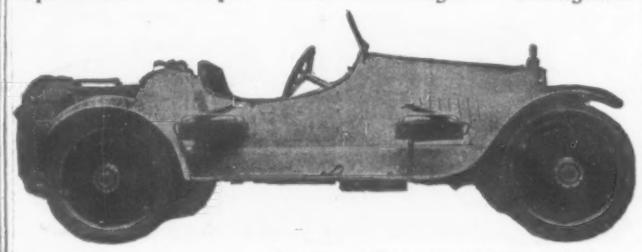


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Speedster — Coupe — Four Passenger — Brougham



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Provide yourself with a comfortable bed—not a makeshift. You will have perfect comfort while touring with

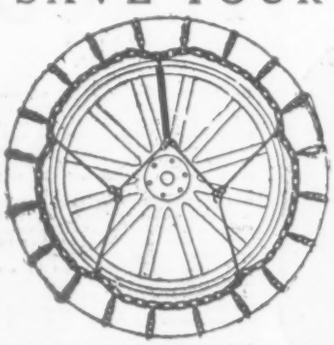
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Tent, bed, dressing room—all in one. Rolls up in neat, compact bundle. Fits running board without being unsightly. Entirely independent of the car.

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MERCHANTS ANTI-SKID CHAIN TIGHTENER

Loose chains slap against the fenders, marring and bending them and creating an infernal racket. Merchant's anti-skid chain tightener prevents this by gripping the chain at five points, giving an easy tension all around. Write today for full details.

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Lethermet Nails come enameled to match practically any shade of leather or upholstering in plain or Spanish effects. Send for our catalog containing prices.

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Investigate the Le Bron Buffer and Power Plant. Air outfit connected if desired. 2, 3 and 5 H.P., any voltage; dustproof and ball bearing motor.

USERS: This outfit will pay for itself immediately

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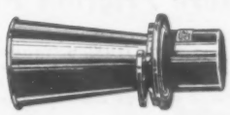
Le Bron Electrical Works
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HAND OPERATED

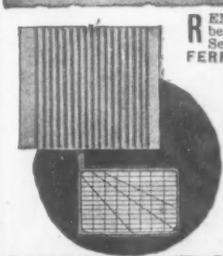


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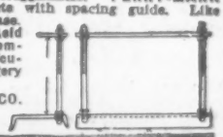
REMEMBER all the battery repairs you've made? Remember how important good Separators are? Cheap, untested Separators have spoiled many a good Battery.

FERRY-MARK Guaranteed Battery Separators—Chemically treated for long service. Cost no more than ordinary ones.

FERRY-MARK Battery Plates. High capacity special material to overcome sluggishness. FERRY-MARK Burning Rack. Complete with spacing guide. Like cut or with wood base.

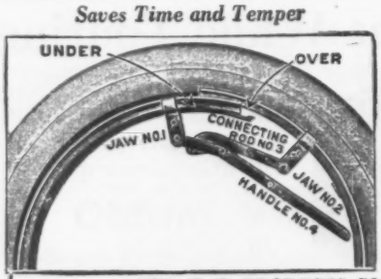
Also Battery Boxes, Acid Proof Paint, Sealing Compound. Write for particulars, prices on all Battery Supplies.

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Saves Time and Temper



Makes It Easy

to open and close split rims of all types.

Will cause the most stubborn rim to yield.

Price $3.50

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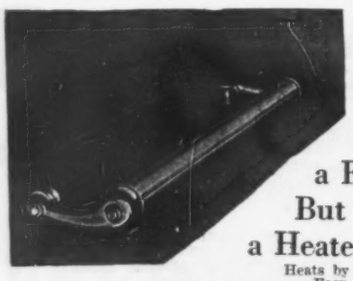
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SPEEDWAY BODIES FOR FORDS



$1.00 INCLUDING FIAT TYPE RADIATOR SHELL UNDERSLUNG WITH BODY *FREE* OR PARTS ALONE.....$12.50

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Heats by exhaust gases.
Easy to install.
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Stationary Foot-rest Heater, $15.00.

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One curtain fits any car, making it unnecessary to carry a large stock. A feature of great value to every dealer and not possessed by any other make of curtain.
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"Master" Governor for Fords Limits Speed and Expense

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Your Speed Limit When Master Equipped Is:

Standard FORD.....23 miles per hour
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Dealers: Buy direct from your jobber or send us his name, also your order, we will fill direct.

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New Departure Ball Bearings

FOR THE REPAIR SHOP

Here's a Job that Never Left the Crank Case

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Price of Tool, complete, $10.00 net. Prepaid. Extra Cutters 30 cents each.

you can do the job yourself by hand in your own shop without machinery of any kind. One hour completes the entire shaft and it's accurate to the thousandth. It is not even necessary to remove the shaft from the crank case. If you believe in better profits and quicker service to your customers send along your order today.

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Fibre Friction Fillers for Repairs

When you need friction fillers for repairs on any car using friction transmission we can supply your needs promptly and correctly. In ordering, give make and model of car and, if possible, the inside and outside diameters of the fibre ring; also face width.

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This grease gun exerts a pressure of at least 900 pounds at the nozzle, and is the only gun in existence that will force rust, corrosion and old, hard grease out of a clogged bearing and leave it filled with fresh grease.

Lubrication is the life of the car—Clogged or dry bearings the death of it.

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A $50 FIDELITY BODY

And a Second-Hand Ford Can Be Sold at 100% Profit.

FIDELITY BODIES $35 And Up

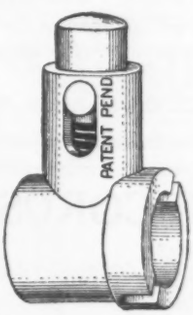
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Starts Motor First Time in Zero Weather

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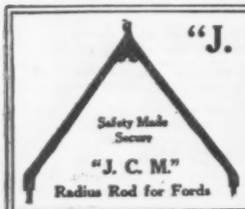
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Standard Power for Automobiles and Trucks

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You can depend upon J. C. M. Radius Rods to give years of service—put them on and forget about them. For the rods are inserted and clamped into a patented socket at the head end—not brazed or welded.

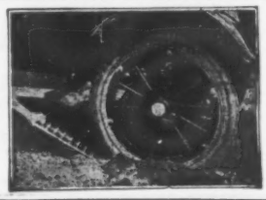
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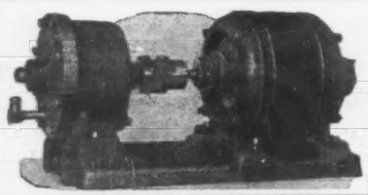
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Dealers Sell Them On That Basis



Hill 3-A Spark Plugs cannot short circuit, leak compression, foul, or break. The design specifically provides against these evils. DEALERS—They will GO ON and STAY on the meanest motor that ever pumped oil. Order a set and prove it. Price $1.25. Liberal discounts.



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Swings in a 9-ft. circle. Water and light where you need them.

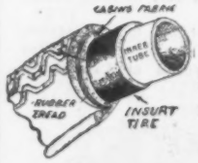
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Every dealer who has seen a cross section of these new tires has placed his order. Write for prices.

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Price $2.00



Write for "The Hillmeter Reasons" to the manufacturers.

HILLMETER
registers road grades and accurately determines an engine's—(1) Performance; (2) Efficiency; (3) and a Car's "free rolling"—the three determining factors of economy and safety.

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—it's a whole wrench kit in itself.



A Jiffy Fit on any nut ¼" to 2¾ HEX OR SQUARE

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THE TWO-TON TRUCK WHICH, IN ACTUAL PERFORMANCE, PROVES ALL CLAIMS MADE FOR IT.

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YOU CAN RE-COVER IT YOURSELF
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$6.84 and up
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New roof, and quarters sewed together. New Rear Curtain. Tacks, binding and fasteners. All ready to apply. We furnish printed instructions with each top. Give us name of your car, year and model number and we will quote you exact prices.

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"ANYTHING AND EVERYTHING FOR AN AUTO"

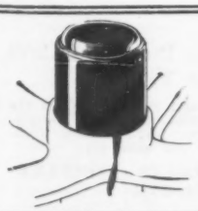
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A SELECTIVE SLIDING GEAR FOR FORDS

Three speeds forward and reverse. Gives the Ford car same ease of control as common on all other types. A wonderful evolution that is attracting favorable attention the country over. This is a valuable state-right concession for men of responsibility and initiative. Write or wire for particulars.

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A Growing, Profitable Business

Easy to learn; instruction book $1. Three weeks practical school course free. Plants $50 and up. Our catalogue free. We save you 25% to 40% on up-to-date plant.

AUTO TIRE EQUIPMENT CO.

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HIGHEST QUALITY—MODERATE PRICE

Dealers are invited to write for Michelin's attractive proposition

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19 Wholesale Branches Assure Prompt Service



A Few Live Dealers Wanted for

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"America's Greatest Truck"

2-3½ and 5-ton, with Electric Light, Enclosed Cab, and Metal Wheels as part of regular equipment.

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Westinghouse		Leece-Neville
Berling Magnetos		Connecticut



STANDARD RADIATOR

Make big money selling this 2½ in., brass core radiator. Interchangeable with regular Ford, fits Ford shell. Retail Price complete $21.00. Less shell $19.50.

STANDARD RADIATOR CO., Inc.

SPRINGVILLE, NEW YORK

S.O.S. Fire Extinguisher

It is death to any blaze. The top is sieved with small holes—you just throw or spray the liquid at the fire. Will not corrode metal. Fool-proof, leak-proof container. Dealers, write for profitable co-operative selling plan.

HARTLEY MFG. CO. Newark, N. J.

DAILEY MOTOR TRUCK BODIES

CHICAGO

FOUR BODIES for THE PRICE OF ONE

H. R. DAILEY AUTO TRUCK STEEL BODY CO.

3028 Carroll Ave., Chicago



BOYCE FIRE EXTINGUISHER

Works Both Automatically and By Hand

BOYCE-VEEDER CORPORATION

Long Island City, N. Y., U. S. A.

J&B MANUFACTURING COMPANY PITTSFIELD, MASS. U.S.A. J&B PRODUCTS

J. & B. Bushing Remover

List, $1.00 For ½-in. Spindle Body Bushing

Quick Work—No Damage

Made of high-grade nickel steel. Built in a way that insures service. Easily inserted in spindle body. A few taps with hammer does the trick. Bushing can be driven out without removing wheel.

J & B MANUFACTURING CO., Pittsfield, Mass.

See Full Page, 2nd Issue Each Month.

The Motor Truck bought today without Electric Starting and Lighting will be out of date to-morrow

BETHLEHEM

Internal Gear Drive

MOTOR TRUCKS

Dependable Delivery

BETHLEHEM MOTORS CORP'N, ALLENTOWN, PA.

The Motor Truck bought today without Electric Starting and Lighting will be out of date to-morrow

ULTRA GLASS

absolutely impenetrable and non-scattering under direct impact or indirect concussion (e. g., door slam). Finer than the finest plate glass in appearance. Send today for a sample and our sales proposition.

Glass Founders Corporation **Milltown, N. J.**

AUTO & FURNITURE POLISH

Removes grease spots, covers scratches and restores original finish; costs 50c gallon; easy to make, easy to sell; 500% profit. Full directions 25c (no stamps). Money back if not satisfied.

AUTOMOTIVE MFG. CO.

P. O. Box 1827 **Washington, D. C.**

Commerce TRUCKS

"For Business"

1-1½ and 1½-2 Ton CAPACITIES

FULLY EQUIPPED with impulse starter, electric lights, windshield and bumper.

The Commerce Motor Car Co.

Mfrs. of Motor Trucks

DETROIT, MICHIGAN

9th Year

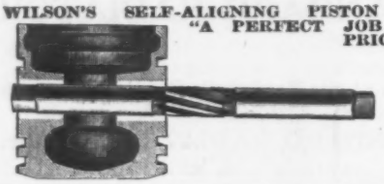
INSYDE TYRES

—genuine inner armor for auto tires. Double mileage; prevent punctures and blowouts. Easily applied between casing and tube without tools, in any tire old or new. Distributors and agents wanted. Previous selling experience unnecessary. $25.00 profit per day easy. Details free. Big Profits. Sales Guaranteed. Good Service.



American Accessories Company **Dept. 237** **Cincinnati, Ohio**

WILSON'S SELF-ALIGNING PISTON BUSHING REAMER
"A PERFECT JOB FIRST TIME THRU"
PRICE, $5.00



Reams both bushings in perfect straight line. Fully guaranteed. Get my catalog. Complete Ford Shop Equipment.

K. R. WILSON
10-16 Lock St.,
BUFFALO N. Y.

FEUMORT FIRE EXTINGUISHER



—the new fire-fighting dry chemical guaranteed to extinguish a fire in less than two seconds. It is put up in one-fourth gallon handy metal cylinders which have the extinguishing power of 41 gallons of water.

Feumort has no pumps or valves to rust or corrode. Fits on any car or truck. $5.00 each.

FEUMORT MFG. CO., INC.

160 Fifth Ave. New York City

BOSCH



America's Supreme Ignition System

AMERICAN BOSCH MAGNETO CORPORATION
Main Office and Works: Springfield, Mass.
Branches: New York Chicago Detroit San Francisco

LAMBERT LICENSE PLATE HOLDER



Exact Size—Dealers Wanted

Slip holder through plate, then through bracket, give quarter turn and your plate is on to stay.

No Noise. No Rattle.
Retail Price, $1.00 per set of four.
Write for discounts

LAMBERT MFG. CO.

Highland Bldg. **Pittsburgh, Pa.**

RAJO VALVE IN HEAD FOR FORDS

Manufactured by
Rajo Motor Co., Racine, Wis.

SPEED—POWER—ECONOMY

Dealers—This Valve in Head Sells on Sight
Write for Details

TRINDL SALES CORP.
Exclusive Distributors
2917-21 S. Wabash Ave., Chicago

LIGHT UNIVERSAL POWER

Our Farm Lighting Proposition Will Interest You

Universal Farm Lighting and Power Units are the result of 20 years' production experience. Simple, efficient, satisfactory. The leading Farm Electrical System. Write for our sales plan.

UNIVERSAL PRODUCTS COMPANY
Sandusky, Ohio

The "LongStroke" COMPRESSOR

(Write for descriptive folder)



MOTOR-COMPRESSOR CO.
52-60 Dickerson Street, Newark, N. J.



Starter Steel Ring Gears

for fly wheels of all cars carried in stock

REPLACES the cast teeth of original fly wheel. Gives diameter, and number of teeth on fly wheel, and write us for prices.

Immediate Service

Kent Auto Parts Co.
Denver, Colo.



TRANSCO-FLUXOID For Repairing Scored Cylinders

A patented preparation, which enables you to repair scores in cylinders cheaper, quicker, and safer than regrinding or welding. One bottle (enough for several scores) and book of instructions, $10.00. Every bottle guaranteed.

TRANSMUTED METAL COMPANY, 3334 Chicago Ave.
(Formerly Victory Aluminum Solder Co.), Chicago, U. S. A.

BRAENDER TIRES

Bulldog Tread — Non-Skid Fabric — plain Tread and Super Cord.

DEALERS — We have a live proposition for you. WRITE

Distributed by

6,000 Mile Fabric **10,000 Mile Cord**

ACORN TIRE AND RUBBER CO.

1350 Michigan Ave. **Chicago, Ill.**

JUMBO The COMPLETE TRUCK

FULL LINE OF SIZES COMPLETELY EQUIPPED.
NO EXTRAS TO BUY EXCEPT BODY.

NELSON MOTOR TRUCK COMPANY, Saginaw, Mich.

EARN WHILE YOU LEARN THE AUTOMOBILE BUSINESS

You can really EARN WHILE YOU LEARN to be an automobile expert at the Central Auto School. Awake to your opportunity and write now for details of our exceptional plan.

CENTRAL AUTO SCHOOL 83 W. Fort St. Detroit, Mich.

THE CLEARING HOUSE
OF THE MOTOR INDUSTRY

FOR PARTS, ACCESSORIES, TIRES, MACHINERY REBUILDING, REPAIRING, WELDING AND USED CARS. ALSO HELP AND SITUATIONS WANTED AND MISCELLANEOUS CLASSIFIED ADVERTISING

IF IT'S AUTO PARTS YOU WANT
Wire-Write or Come to Warshawsky—

Every Used Part Is in First Class Condition, and Will Render Satisfactory Service. If We Cannot Satisfy You, Your Money Will Be Cheerfully Refunded

SPECIAL MOTOR BARGAINS

All in Excellent Condition

UNIT POWER PLANTS

Wisconsin Out of Cutting 4 cyl.	$100.00
Menominee 4 cyl.	100.00
Rutenber 4 cyl.	100.00
Master 6 Chalmers 6 cyl.	125.00
Knox 6 cyl.	175.00
Haynes 6 cyl. with starter and generator	175.00
Patterson Northway 4 cyl.	125.00
Stoddard Knight 6 cyl.	200.00
Hershoff Spillman 6 cyl.	175.00
Continental 6 cyl. with starter	150.00
Hershoff Spillman 4 cyl.	150.00
Model engine 4 cyl.	125.00
Jackson 4 cyl.	150.00
Haynes 4 cyl.	125.00
Allan 40 4 cyl. with gen.	125.00
Continentals 4 cyl. with magneto	175.00
Lozier 4 cyl.	100.00

MOTORS—ONLY

Continental E 4 cyl.	100.00
Continental C 4 cyl.	100.00
Continental C 4 cyl. with starter	100.00
Continental R 4 cyl.	100.00
Continental P 4 cyl.	100.00
Northway 4 cyl.	85.00
Stoddard Dayton 4 cyl.	100.00
Packard 18 4 cyl.	125.00
Overland 83 en-bloc	100.00
Overland 69	85.00
Overland 79	95.00
Marion Stutz New 4 cyl.	125.00
Marion Stutz 4 cyl.	100.00
Buda 4 cyl.	90.00
Alco 4 cyl.	75.00
Wisconsin 4 cyl.	125.00
Mitchell 1913 T Head 4 cyl.	100.00
Knox 4 cyl.	100.00
Reo 4 cyl.	75.00
Staver 4 cyl.	90.00
National 4 cyl.	125.00
Cadillac Marine 4 cyl.	100.00
Commerce 4 cyl.	75.00
Renault 4 cyl.	90.00
RCH 4 cyl.	60.00
Premier 4 cyl.	100.00
Marmon 32 with starter and generator	150.00
Hudson 6 cyl. 6-54	125.00
Peerless 6 cyl.	125.00
Premier 6 cyl.	100.00
National en-bloc	135.00
Northway 6 from Cole with centre control, starter and generator	150.00
Rutenber 6 cyl.	125.00
Continental with starter	125.00
Rutenber 6 out of Auburn	125.00
Mitchell T Head 6 cyl.	125.00
Alco 6½ Ton Truck	150.00
Peerless 6 cyl.	150.00
Studebaker 4 cyl 25	90.00

WE BUY BOSCH MAGNETOS

MOTOR GENERATORS

Wagner 13 Studebaker	$25.00
Jesco	25.00
20 Delco	30.00
Gray & Davis 2 Unit	35.00
Westinghouse S W 1158 A	30.00
New Remy Model 180B 6 volt Starter and Generator	60.00
Remy 5, 6, 3, SJ2, 535	$35.00
Disco 16 E—12 volt	35.00
Apple, Mod 28 A	25.00
Intz-White	35.00
Northeast	20.00
Apple—A28 for Mitchell	25.00

1000 New

Jones Flush Type Speedometers

Complete, $7.50 each

Lots of 12 or More, $6.00 each

COMPLETE LINE OF NEW PARTS
For All Standard Makes of Cars
NEW & USED GEARS & BEARINGS

Specials in New Parts and Material

New Sterling Touring Jacks, 1800 lbs. capacity, each	$1.75
New Sterling Touring Jacks, 2000 lbs. capacity, each	4.00
New Axle Shafts for No. 83 Overlands, each	3.50
New Radius Rods for Fords, each	1.75
New Ford Racing Bodies, hoods, Radiator Shell, Upholstered, priming coat, crated for delivery,	$45.00
New Ford Fans	1.25
New 1 and 1½ ton truck bodies	$60.00
New Elgin Chummy Roadster Tops, complete with curtain and top boot	$25.00
New Channel Bar Black Bumpers for Fords	3.50
New Channel Bar Bumpers for all cars, black enamel or nickel	4.50
New Autolite ammeters, 20 amp., $1.50; 30 amp.	2.00
New One-Man Top Windshields	8.00
Connecticut 3-button switches	1.75
National Standard Medium Jacks, Garage Type	1.50
Heavy Grease Guns	.50
14,000 ft. new radiator hose. Price per ft., 1-in., 15c; 1¼-in., 17½c; 1½-in., 20c; 1¾-in., 22c; 2-in., 25c; 2¼-in., 27½c; 2½-in., 30c; 2¾-in., 32½c.	
Tortoise Shell Goggles	$0.35
Master Vibrators for Fords	3.00
New Running Board Tire Brackets for all cars, per set	$1.50
New Hand Horns	2.00
Double Barrel Pumps	2.50
Single Barrel Pumps	1.50
Head Lights for Fords, Pair	3.50
Top Dressing, ½ pt. can	.35
Ray Shock Absorbers, for Fords, set of four	5.00
Ford Hood and Radiator Covers	2.50
Heaters, radiators and cushions for all cars.	

NEW LAMPS

11 inch single bulb	$6.00
10 inch single bulb	5.00
Electric tail lights	.85
Electric side lights, pair	1.75

NEW BRAKE LINING
Price per ft.

1¼-in., 20c	1½-in., 25c
1¾-in., 30c	2-in., 30c
2½-in., 35c	3-in., 40c
3½-in., 45c	

FLEXIBLE TUBING
Price per ft.

1¼-in., 25c	1½-in., 30c
1¾-in., 35c	2-in., 40c
2¼-in., 45c	2½-in., 50c

New Bailey Differentials for Overland Models 80, 81, 83 $10.00

PREST-O-LITE TANKS

Model B $5.00 each; E $3.50 each

Searchlight Tanks $2.50

New and Used Rims—All Makes

New Pneumatic and Solid Truck Tires

GOOD USED TIRES AND TUBES

OBTAINED FROM WRECKED CARS—WRITE FOR PRICES

MAIL ORDERS SHIPPED SAME DAY

HIGHEST PRICES PAID FOR WRECKED CARS

MAGNETOS
Overhauled and Guaranteed

New DU4 Variable	$35.00
DU4 Bosch Set Spark	25.00
DU4 Bosch Variable Spark	27.50
DU6 Bosch	32.50
DR4 Bosch	20.00
DR4 Bosch 2 spark	65.00
DR6 Bosch	25.00
DR6 Bosch 2 spark	75.00
D4 Bosch	15.00
D6 Bosch	17.50
D6 Bosch 2 spark	45.00
NU4 Bosch	15.00
ZR6 Bosch	50.00
ZR4 Bosch 2 spark	100.00
Eisemann Dual	15.00
Remy Model RL & D	7.00
Dixie Mags.	12.00
New Dixie Mags. 4 cyl.	18.00
New Sims H T	18.00
Mea	12.00
New Splitdorf Type E	12.00

COILS

Bosch Type A	$7.50
Bosch Duplex	4.00
Eisemann	4.00
Splitdorf	4.00
Silent Starter and Generator Chains; all lengths and sizes.	
New 8-cyl. Delco distributors.	12.00

GENERATORS

Gray Davis G. G. I. C.	17.00
Ward Leonard AG T.	10.00-12.00
Vesta	12.00
Berdon	10.00
Delco Oakland	10.00
Ward Leonard for King	15.00
Rushmore No. 1	15.00
Westinghouse with distributor 210	25.00
Leece-Neville, 12 volt	16.50
New Leece-Neville No. 0110	20.00
Northwestern	10.00
Autolite	10.00-15.00
Westinghouse No. 750	15.00
New Westinghouse 209 R	20.00

STARTERS

Autolite No. 7049-2407-6145	15.00-20.00
Autolite for Abbott	15.00
Gray Davis Chalmers	20.00
Leece-Neville Haynes	20.00
Gray Davis, Lozier and others	30.00
Autolite, Overland 79, 81, 82	15.00-20.00
New Leece-Neville No. 0158	25.00
Bijur Apperson	25.00
Allis Chalmers	15.00
Remy 182	20.00
Packard	20.00
Deaco	20.00
Starter for Palmer Singer	20.00
Westinghouse 533-S W 103	25.00
New Westinghouse Round Type No. 750 with bendix drive	25.00
Allis Chalmers	15.00
Wagner for King	20.00

SECOND-HAND CAR DEPT.

$150.00 to $550.00

50 to 75 exceptionally good used cars at prices so low that they would even interest dealers.

SPEEDOMETER HEADS

Stewart or Warner	$1.50 to $4.00
New Stewart flush type	5.00
Pyrene Fire Extinguishers	6.00

DEPOSIT REQUIRED WITH ALL ORDERS

WARSHAWSKY & CO.

LARGEST CAR WRECKERS IN THE WORLD

1915 SOUTH STATE STREET PHONE CALUMET 7315 CHICAGO, U. S. A.

OUR THREE BRANCHES ARE READY TO SERVE YOU

Located in three of the big markets of the country, our branches have buying and shipping facilities that are unsurpassed. Because we buy in such enormous quantities for these three branches we can demand, *and get,* used parts of unquestioned quality. We do not have to take "what we can get." We are in a position to take our choice, and this means that when *you* order used parts from Auto Salvage Co. you are ordering parts that are above the average in quality. *And you pay less for them.*

We Can Make Immediate Deliveries

Our records show that we fill 87% of the orders we receive. That's something to be proud of. And practically all orders are filled and on their way the same day we receive them. When you send an order to us you are taking only thirteen chances out of a **hundred** of not having your order filled *immediately.*

Our Stocks Are Complete

We take pride in the fact that our stocks are kept complete and up to date at all times. We are not handicapped in any way in the purchase of parts. Our branches are located where we can get parts and we have the capital to buy on a quantity basis.

Write to Our Nearest Branch for Prices

Below you will find the addresses of our three branches. Send your order to the nearest branch or ask for prices on the parts you need. We guarantee a saving of 50% on manufacturers' list prices. Get in touch with us **now.**

USED—PARTS—NEW

We Guarantee Every Part We Sell

ABSOLUTELY NEW, HIGH GRADE GEARS

MOST OF THEM AT LESS THAN MANUFACTURER'S PRICES
NEW PINIONS & DRIVE GEARS FOR FOLLOWING CARS

MOTORS

Packard 6	$175.00
Peerless 6	175.00
Mitchell 6	150.00
Pierce 48-6	175.00
Pierce 36-6	150.00
E M F 4	65.00
Flanders 4	65.00
Overland 4	75.00 (blocks cast single)
Overland 4	$100.00 (cast en block)
Northway block motor unit power plant	$150.00
Buick 31 unit power plant	150.00
Stoddard Dayton 4	85.00

NEW TIRES

We are selling **new** high grade tires at lowest prices. These tires are guaranteed for 6,000 miles.

30 x 3 NS	$10.75
30 x 3½ NS	12.50
32 x 3½ NS	15.50
31 x 4 NS	17.00
32 x 4 NS	19.00
33 x 4 NS	19.50
34 x 4 NS	20.25

We have a complete stock of *new* pinions and drive gears for following cars—various models:

Allen, Apperson, Buick, Chandler, Cadillac, Chevrolet, Covert, Elgin, Empire, Grant, Hudson, Hupp, Jackson, Maxwell, Mitchell, Overland, Oldsmobile, R C H, Regal, Studebaker, Haynes

and others not listed; also transmission gears for many makes.

New Lamps

Electric, double bulb headlights $6.50
Electric Tail Lights.. .75

Complete Presto-Lite Outfits

Tank, type B, Pair of New Headlights and tubing $14.75

New Fan Belts

New Standard, high grade rubberized fabric, fan belts—**20c to 50c Each**

NEW HIGH GRADE TUBES

Up to 32 x 3½ size	$2.00 each
Above 32 x 3½ size	2.50 each

We Fill 87% Of The Orders We Receive

AUTO SALVAGE COMPANY, INC.

"LARGEST NEW AND USED PARTS CONCERN IN THE WORLD"

Kansas City, Mo. 1701-03 Main St.
St. Louis, Mo. 2823-25 Locust St.
Cincinnati, Ohio 312-314 East Third Street

THE ORIGINAL
"We Tear 'Em Up and Sell the Pieces"

Parts for Over 300 Models of all Standard Make Cars

GUARANTEE: Positively Every Part Sold Guaranteed to Be As Represented or Money Promptly Refunded.

The Greatest Bargain List of High Grade Guaranteed Used Parts Ever Assembled

Read Every Item Each is a Bargain All Guaranteed

MOTORS
Send for list
$30.00-$150.00

UNIT POWER PLANTS
Send for list
$75.00-$200.00

REAR AXLES
$25.00-$75.00

FRONT AXLES
$5.00-$15.00

RADIATORS
$10.00-$30.00

WHEELS
$2.00-$7.50

STARTERS
$15.00-$30.00

GENERATORS
$12.50-$20.00

WINDSHIELDS
$6.00-$10.00

LAMPS
$3.00-$8.00

BEARINGS
Any style or kind
50c-$5.00

SPRINGS
$3.00-$7.50

SPRING LEAVES
25c-50c

TUBE VULCANIZERS
50c

RIMS
$2.50-$4.00

FELLOE BANDS
$1.00-$1.50

CRANKCASES
$10.00-$50.00

CYLINDERS
$5.00-$30.00

CRANK SHAFTS
$5.00-$30.00

CONNECTING RODS
$1.50-$5.00

PISTONS
$1.00-$3.00

TIRES

5,000 Miles Guaranteed

Here's Your Chance to Save!

30x3½	Rib	$12.88
31x4	Rib	20.05
31x4	Non-Skid	21.74
33x4	Rib	21.60
33x4	Non-Skid	22.20
34x4	Rib	21.92
34x4	Non-Skid	23.81
34x4½	Rib	30.06
35x5	Non-Skid	41.36
36x4½	Rib	31.52
36x4½	Non-Skid	33.91
37x5	Rib	38.62
37x5	Non-Skid	43.54

All Fresh, New Stock and Fully Guaranteed

DIFFERENTIALS
$10.00-$20.00

AXLE SHAFTS
$1.50-$7.50

RING GEARS
$1.00-$20.00

TRANSMISSION GEARS
50c-$20.00

SPOT LIGHTS
$5.00

SPARK PLUGS
25c-75c

TRANSMISSION CASES
$7.50-$25.00

DIFFERENTIAL GEARS
50c-$1.50

JACKS
$1.00-$8.75

GASOLINE TANKS
$2.00-$7.50

PRESTO TANKS
$5.00-$6.00

COLD PATCHES
10c Dozen

METAL POLISH
10c-15c-25c

TOP COVERS
$1.50

TRANSMISSION
$25.00-$50.00

CARBURETORS
$3.00-$15.00

Reliners

	Each
28x3	$0.75
30x3	.75
Lots of 6	.60
30x3½	1.50
Lots of 6	1.25

Inside Blowout Shoes.

3, 3½ or 4 in.	$0.25
Dozen lots	2.25

Patch Outfits With Cement in Cartons

30 sq. inches—	
Reg. Price	$0.50
Our Price	.25
Doz. Lots	1.80
72 sq. inches—	
Reg. price	$1.00
Our Price	.50
Doz. lots	3.60
144 sq. inches—	
Reg. price	$2.00
Our price	1.00
Doz. lots	7.20

Vulcanizing Cement

1 Pint can	$0.50
1 Quart can	.75

Cotton Gloves Just the Thing for Working Around Auto

Single pair	$0.15
6 pair	.75
1 doz. pair	1.25

If You Don't See What You Want, Wire, Write or Phone Your Orders to

Auto Wrecking Company

13th and Oak Street **Kansas City, Mo.**

NEW OVERLAND MOTOR PARTS

For Model 83B-85-4 and All Others

These Motors Were Purchased From the British War Mission and We are Tearing These NEW Motors Down for Parts

WE HAVE ALL MOTOR AND OTHER PARTS FOR IMMEDIATE SHIPMENT

Brand New 83B and 85-4 Motors

Motor Complete with Clutch and Flywheel. $150.00 Motor Complete with Bosch Magneto, New Autolite Starter and Generator, $215.00
These motors will fit exactly in the frames of Overlands model 79-80-81-83-85 and many other cars and trucks.

Some of Our Prices on New Parts

Cylinder Block	$24.50	Autolite GD Generators	$25.00	Flywheel	$14.50
Cylinder Head	8.50	Whitney Chains for Autolite Generators	2.50	Main Bearings, Complete Set for	2.75
Upper Crankcase with Main Bearings and Camshaft	27.50	Crankshaft	16.50	U. S. L. Batteries for Overland	23.50
Lower Crankcase	12.50	Connecting Rod and Piston Assemblies	7.50	Autolite Starters	25.00
Clutch	15.00	Timing Gears, Complete Set	3.50	Overland Radiators for 79-81-83 and 85-4	30.00
Clutch Spider with Bearing	4.00				

We Have a Full Line of Used Parts for any Model Overland Cars. At Lowest Prices—Gears, Wheels, Transmission Cases, Clutches, Flywheels and all Differential and Rear End Parts
WRITE WHAT YOU NEED AND WE WILL QUOTE PRICE BY RETURN MAIL

NEW AXLE SHAFTS FOR ANY MODEL

Overland or Studebaker.....$3.25 | B-Presto Lite Tanks Filled.....$7.50

Special Prices on New Accessories and Equipment

2" Black or Nickel Badger Channel Bar Bumpers—for all cars	$ 4.25	2x3-16 Gomo Brake Lining per 100 ft.	$25.00
Peerless Running Board Pumps with 10 ft. hose	1.65	Roller Smith Battery Indicators as used on Dodge and Studebaker	1.10
Radiator Hose—all sizes 1" to 3" diam. 3 ft. lengths per ft.	.18	Golden Giant Spark Plugs, any size	.47
		½" Special Plug	.28

LAMPS

Square Oil Truck Sidelamps per pr.	$ 2.25	Grey & Davis Bullet Type Electric Side Lamps per pr.	$ 3.50

NEW CARBURETORS

Stromberg LB2 — 1¼" side inlet	$ 7.50	Overhauled and Refinished Schebler, Rayfield-Stromberg, Zenith, Miller and Marvel 1-1¼-1½" like new	$ 6.00
Stromberg M 1" top inlet	7.50	With hot air attachment and fittings	7.00
Schebler Model R—1¼"	7.50		
Stromberg 1-1¼ and 1½" with hot air stove and fittings	10.00	Stewart Vacuum Tanks	6.00

Magnetos Overhauled

Bosch DU4, Variable	$24.50	Bosch A coils	$6.50
Bosch DU4, Set Spark	21.00	Bosch Duplex	3.00
Bosch DU6, Dual or Indpt.	30.00	One to four cylinder N. Y. Coils	4.50
ZR4, Two Spark, German waterproof	80.00	⅜-in. Rubber Covered Packard Ign. Cable, per foot	.06
Eisemann, G4	24.50		

Unheard of Prices in New Fresh Standard Make Inner Tubes

Goodyear Heavy Tourist or U. S. First Grade Guaranteed 32x 4 and 34x4, our price.	$ 2.50	Goodyear Grey — Guaranteed Seconds 30x3 30x3½	$ 1.60
28x3 But End Motorcycle Tubes	1.50	31x4 to 37x5	2.35
		Tire Flaps, all sizes	.40

GET OUR PRICES ON FIRST AND SECOND GRADE NEW AND USED TIRES

Schrader Tire Guages, each	$ .95
Schrader Valve Insides, per 100	3.95

Special for Fords

1917-18-19-20 Honeycomb Radiators	$18.50	Whitman & Barnes Dropped Forged Open End Wrenches, sizes No. 21 to 36 (15 wrenches) per set	3.50
Bulldog Spring Bumpers	4.75	10 Ton Buckeye Jacks, each	12.50
Badger 2" Channel Bumpers	3.75		
Speedster Radiators	7.50		

WOODS MOBILETTE SERVICE

Parts for All Cyclecars

500 Radiators built for Woods Mobilette; can be used for Ford speedsters, tractors, aeroplanes and cyclecars, each	$7.50	Boards, 9 in. high, wood matched, strip covered top. Each	$20.00
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Manufacturers. We are in the market for jobs of obsolete stocks of parts and equipment of any kind.

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Alter	Cole	Fisher	Liberty	Omaha	Sphinx
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American	Commonwealth	Geronimo	Luverne	Paige	Staver
Ames	Coreja	Glide	McFarlan	Palmer-Singer	Stephens
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Apperson	Croxton	Great-Western	Maibohm	Partin-Palmer	Studebaker
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Auburn	Daniels	Harroun	Marathon	Peerless	Suburban
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Badger	Detroiter	Havers	Menominee	Pennsy	Templar
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33x4	8.50	1.70
33x4½	9.00	1.75
64x4	8.50	1.70
35x4	9.00	1.75
34x4½	9.00	1.75
35x4½	9.25	1.80
36x4½	9.50	1.85
88x4½	15.00	2.50
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32x4	7.15	5.65	2.50
33x4	7.80	6.25	2.50
34x4	8.00	6.45	2.50
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We Match or Make All Parts the Day We Receive Order

Save 35% to 80%

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New motor parts, axle parts, transmission parts, clutch parts, universal joints, piston rings, gears of all kinds, axle shafts, fenders, etc.

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Chalmers: E-F-L-M-10-Six-36: 6-18; 6-24; 40
Chevrolet: B. G. 4-90 Clark: 40
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Crawford
Cameron
Detroiter
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Flander: 2 & 3 Speed
Firestone Columbia Fuller
Ford: N-R&S
Great Northern
Halladay: 40
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Hupp: 20-32
Hudson: 20-Six-54
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Jackson: 2&4 Cyl.-Olympia & Majestic
Jones: SIX: 1915-16
King:36; Krit:20
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Knox: 40; Little Lamber:2&4Cyl.
Lexington: 40
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Marmon: 32
Maxwell: 2&4 Cyl. F-K-Q-25-1913-14-15-16
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Monarch: 40
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Oakland: 2&4 Cyl.: 40
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Oldsmobile: 40
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Packard: 1910
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Paige: 6-16
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Cutting—12
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Flanders—20 2 and 3
Franklin—10
Gay Truck—Model G 1914
Hudson—20, 33
Hup—20
Imperial—34
Jackson—52
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Krit—20-25
Metz—22
Maxwell—To '15
Mitchell—To '16
Moline—10, M35
Moon—13, 40
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Rambler—10
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Reo—10S, 11, 12, 13, 14, 15
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Stoddard-Dayton—H10
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If desired can furnish for $100 extra—1 Atwater Kent Ignition System, 1 Dyneto Starter and Generator, 1 Zenith Carburetor, 1 Switch.

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We carry a complete line of PARTS for all makes of cars.
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New and Used
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Slightly used and factory repaired tires and new tubes

A Satisfied Customer Is Our Biggest Asset—Therefore, We Must Satisfy You

Size	Used Tire	New Tubes	Size	Used Tire	New Tubes
30x3	$4.00	$1.95	34x4	$8.00	$3.40
30x3½	5.00	2.30	36x4	10.00	3.75
32x3½	5.50	2.40	34x4½	8.50	4.15
34x3½	7.00	2.60	35x4½	8.75	4.25
31x4	6.50	3.00	36x4½	9.00	4.40
32x4	7.25	3.05	37x4½	12.25	4.50
33x4	8.00	3.25	37x5	10.00	4.75

Send $1.00 deposit with each tire ordered. Tires will be sent promptly C. O. D. with privilege of examination. Specify style of rim to avoid delay.

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Are highly serviceable if cured in the proper mold. In buying your new mold be sure that it has:
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STEAM GAUGE. That registers accurately.
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MACHINE FINISH. A retread mold must be of sufficient weight to hold heat, and be machined to a smooth finish.
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THE CRESCENT RETREAD TIRE MOLD is the only mold sold today embodying all of these features. Write for our new catalogue, it explains it all.

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30x3	5.00	1.65	37x4	10.75	2.50
30x3½	6.00	1.70	34x4½	9.75	2.50
31x3½	6.25	1.80	35x4½	10.00	2.50
32x3½	6.50	1.80	36x4½	10.50	2.50
34x3½	7.50	1.80	35x5	11.25	2.50
31x4	7.50	2.10	36x5	11.50	2.60
32x4	7.75	2.20	37x5	11.75	2.60
33x4	8.00	2.25			

RELINER FREE WITH EVERY TIRE
When ordering, state whether you want straight side or clincher, plain or non-skid. Send $1.00 deposit for each tire ordered, balance C. O. D., subject to examination. We allow a special discount of 5% if you send the full amount with the order.

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No Deposit Required—All Non-Skid
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33x4	11.50	2.25	37x5	16.50	2.95

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put six cylinder smoothness into four cylinder motors, give any motor more power, more speed, quicker get away and more miles per gallon with less bearing trouble.

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keeps the motor cool, increases power and speed.

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Reduces consumption of lubricating oil.
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Fitted very close.
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Pistons and Rings accurately fitted. Best equipped plant in New England. Prompt Delivery.
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Bijur (large)	9.65
Delco, all types	6.55
Detroit	6.90
Disco	6.55
Dyneto	7.55
Esterline	7.55
Gray & Davis	5.85
Heinze	8.25
Leece Neville	8.25
Liberty Ford	6.20
Remy	$6.20
Rushmore	7.55
Splitdorf	6.20
Wagner (small) E.M. 126-155-165-200	6.55
Wagner (large) E.M. 106-107-114	12.40
Ward Leonard	6.55
Westinghouse (small)	6.90
Westinghouse (large)	9.65
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Two Unit Starting Motor Armatures

	Net Rewind Price
A-B-C	$12.40
Apleco	12.40
Autolite	12.40
Bijur	12.40
Delco	12.40
Detroit	12.40
Disco	12.40
Esterline	13.75
Gray & Davis, H-1, H-2	13.75
Gray & Davis, Y-1	7.55
Heinze	12.40
Leece Neville	12.40
Liberty Ford	8.25
Remy	12.40
Rushmore	15.15
Splitdorf	12.40
Wagner (large)	13.75
Wagner (small)	7.55
Ward Leonard	13.75
Westinghouse	13.75

Single Unit Motor Generator Armatures

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Apleco	12.40
Bijur	15.15
Delco	15.15
Detroit	12.40
Disco	12.40
Dyneto	15.15
Entz	15.15
Esterline	15.15
Eveready	12.40
Fisher	13.75
Genemotor	15.15
Gray & Davis	13.75
Jesco	16.50
Leece Neville	12.40
North East	13.75
Remy	12.40
Robbins & Meyer	13.75
Simms	6.90
R. C. Wells	13.75
Westinghouse	20.65
U. S. L.	96.30

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12 Bar or Segement	$2.15
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Best Possible Service. Reasonable Prices.
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1—15 H. P. Westinghouse....1200 R.P.M.
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THE ONAN TESTING DEVICE
A Test Rack
to drive and test all kinds of generators, magnetos and starters. Inquiries solicited. Manufactured by
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Immediate Delivery Assured
Radiators come complete, black enameled, ready for Mounting
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Repairs in one day—a new radiator in two days.
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Rebuilding, Repairing, and Manufacturing of Radiators for any make of car. Why send your Radiator down East when you can ship to us, save time, expense, freight, money, and be assured of expert workmanship? Our prices are right. We make new Radiators and allow for old ones.
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New cores installed in old or damaged radiators and returned to you within two days after receiving.
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Superior Service Workmanship Equipment
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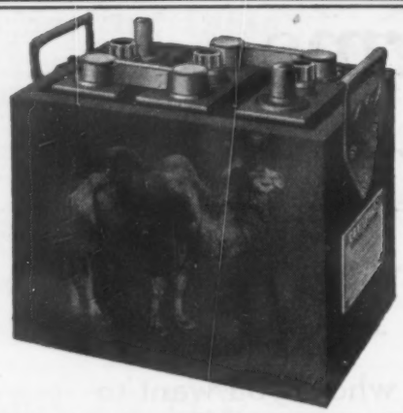
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Rotary Air Compressors
For Garages

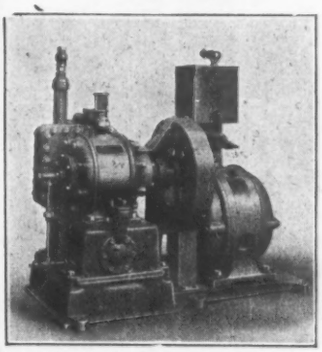
The Jackson ROTARY Air Compressors, for garages, represent the highest achievement in the manufacture of first grade compressors.

The design of the ROTARY Air Compressor saves more than 50% of floor space and weight. Its *rotary motion* eliminates all jar and vibration with a consequent increase in air production.

All five moving parts of the Rotary Air Compressor run in oil. This feature tends to reduce the operating cost to a minimum.

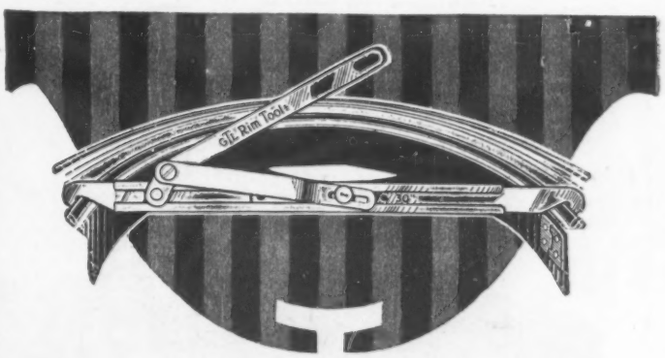
Certainly—the Jackson ROTARY Air Compressor is worth investigating.

12 to 16 cubic feet of air per minute.



Write today for our leaflet "Compressing the Cost of Compressed Air."

THE JACKSON COMPRESSOR COMPANY
INC.
235 South Cherokee Street,
DENVER, COLORADO



Removes the Rim from the Tire—the Safe Way

The T G L Rim Tool eliminates all chance of injury to tube or casing. No prying or hammering. No lost time. In a few seconds the tire is off the rim. 100 pounds on the lever exerts 900 pounds at the rim—either push or pull. This tool is simplicity itself—no complicated parts; strong and durably made; everything firm and secure. Fits any size rim. Dealers find it a popular seller with all classes of motorists.

Write for Our Attractive Dealer Proposition

METAL PRODUCTS MFG. COMPANY
2416 University Ave., S. E. Minneapolis, Minn.

GTL RIM TOOL

Money-Back. Rubber Tube patch in three sizes.

Money-Back. Fabric Casing patch.

Money - B a c k. Combination Tube and Casing repair kit.

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Tube Top and Casing Patches

(Recognized as the stickenest patch on earth)

An absolute money back guarantee on every can. 100% proposition to dealers, backed up by live advertising campaign.

Write for price list.

Money Back Laboratories, Inc.

Oklahoma City, Oklahoma

Over half million satisfied users.



CAMPBELL Storage Battery

Friend of the Motorist
—and YOU:

There are certain things about the Campbell Battery, and more especially about the advertising and dealer co-operation we have worked out, that are of particular interest to every battery dealer.

Recent increase in production makes it possible to supply a few more dealers.

Just a line announcing your interest and we'll give you the whole story.

Campbell Electric Co. KANSAS CITY, MISSOURI

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Rotary Air Compressors
For Garages

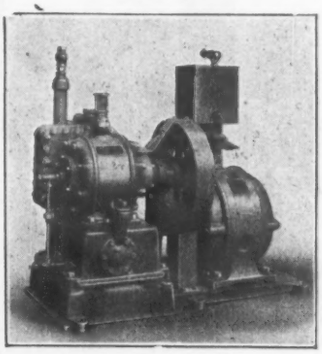
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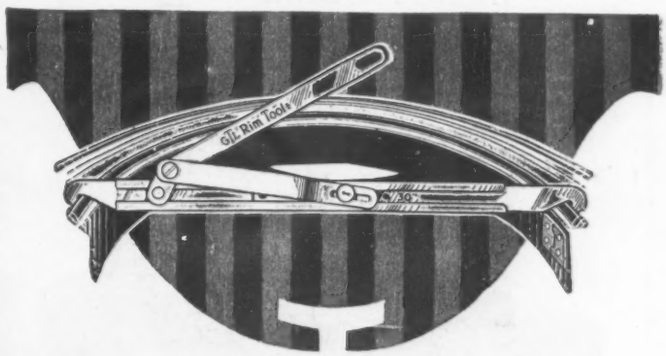
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12 to 16 cubic feet of air per minute.



Write today for our leaflet "Compressing the Cost of Compressed Air."

THE JACKSON COMPRESSOR COMPANY
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235 South Cherokee Street,
DENVER, COLORADO



Removes the Rim from the Tire—the Safe Way

The T G L Rim Tool eliminates all chance of injury to tube or casing. No prying or hammering. No lost time. In a few seconds the tire is off the rim. 100 pounds on the lever exerts 900 pounds at the rim—either push or pull. This tool is simplicity itself—no complicated parts; strong and durably made; everything firm and secure. Fits any size rim. Dealers find it a popular seller with all classes of motorists.

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2416 University Ave., S. E. Minneapolis, Minn.

GTL RIM TOOL



MASTER TRUCKS

One of the leading ten

TEN great American Trucks carry the lion's share of the Nation's Truck-tonnage. Ten Truck Companies out of two hundred make and sell most of America's Trucks. One of these is the Master.

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—1½ *Ton to* 7½ *Ton Chassis*

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Chicago, U. S. A.

Master of the Load On Any Road



For Any Altitude or Any Temperature

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Over two hundred Service Stations in the United States and Canada make it easy for you to investigate what the Zenith can do for your car.

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Overland

TRADE MARK REG.



Soft Riding on Hard Roads

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This Sedan protects passengers from bad roads as well as from bad weather. *Triplex* Springs give it the steadiness of a heavy car of long wheelbase with the economy in fuel, tires and upkeep of a light car.

Overland Dealers report an ever increasing enthusiasm among owners over the greater riding comfort, performance, equipment and appearance of this new car.

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